

APPENDIX J: SUPPLEMENTAL APPENDIX

This Supplemental Appendix contains information and data on which the Final Rule for residential central air conditioners and heat pumps is based. Most data contained in this appendix provide results based on the use of Reverse Engineering manufacturing cost data. The tables and figures presented in this appendix usually have a corresponding table or figure from one of the chapters in the Technical Support Document (TSD). Tables and figures in this appendix with corresponding information in the TSD use the same table or figure numbers as the TSD but with an “S” added after the number to designate it as supplemental information. For example, Table 5.28 from Chapter 5 of the TSD that provides average repair costs based on ARI mean manufacturing cost data is shown in this appendix as Table 5.28S with the results based on Reverse Engineering manufacturing cost data. There are some tables and figures in this appendix that do not have a corresponding table or figure from the TSD. In these cases, the supplemental tables and figures are identified with the table or figure number from the TSD that the new data most closely pertains to and an “A” is added after the number to designate it as additional information.

J.1 SUPPLEMENTAL TABLES AND FIGURES TO CHAPTER 5

Table 5.3S Reverse Engineering Standard-Level Manufacturer Cost Multipliers

SEER	Split A/C Most Likely Value	Split HP Most Likely Value	Package A/C Most Likely Value	Package HP Most Likely Value
10	1.00	1.00	1.00	1.00
11	1.12	1.05	1.09	1.08
12	1.28	1.13	1.16	1.13
13	1.44	1.30	1.43	1.38
18 ^a	1.99	1.94	1.87	1.86

^a Cost multipliers for 18 SEER are based on data for 15 SEER.

Table 5.8S Weighted-Average Total Installed Costs for Central Air Conditioners and Heat Pumps based on Reverse Engineering Manufacturing Costs

SEER	Split A/C 1998\$	Package A/C 1998\$	Split HP 1998\$	Package HP 1998\$
10	\$2,236	\$2,607	\$3,668	\$3,599
11	\$2,327	\$2,696	\$3,723	\$3,691
12	\$2,449	\$2,765	\$3,812	\$3,748
13	\$2,571	\$3,032	\$4,000	\$4,034
18	\$2,990	\$3,466	\$4,707	\$4,584

Table 5.28S Central Air Conditioner and Heat Pump Average Repair Costs based on Reverse Engineering Manufacturing Costs

SEER <i>Btu/W·hr</i>	Split System A/C <i>1998\$</i>	Single Package A/C <i>1998\$</i>	Split System HP <i>1998\$</i>	Single Package HP <i>1998\$</i>
10	\$26	\$34	\$38	\$39
11	\$26	\$34	\$38	\$39
12	\$27	\$34	\$38	\$40
13	\$27	\$35	\$39	\$40
18	\$46	\$57	\$66	\$66

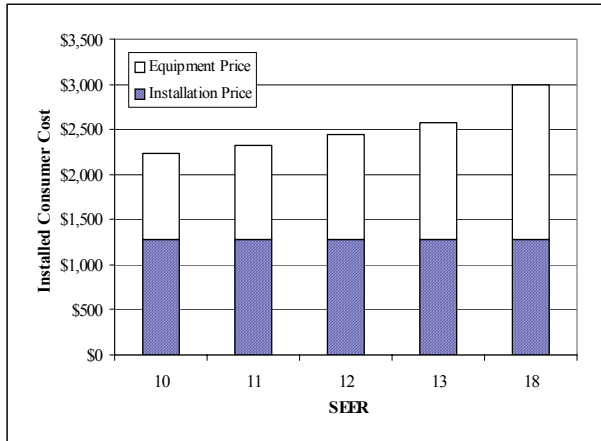


Figure 5.29S Split A/C: Mean Installed Consumer Costs based on Rev Eng Manufacturing Costs

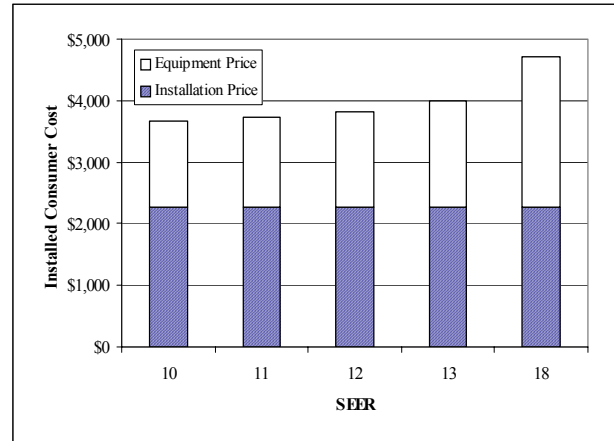


Figure 5.32S Split HP: Mean Installed Consumer Costs based on Rev Eng Manufacturing Costs

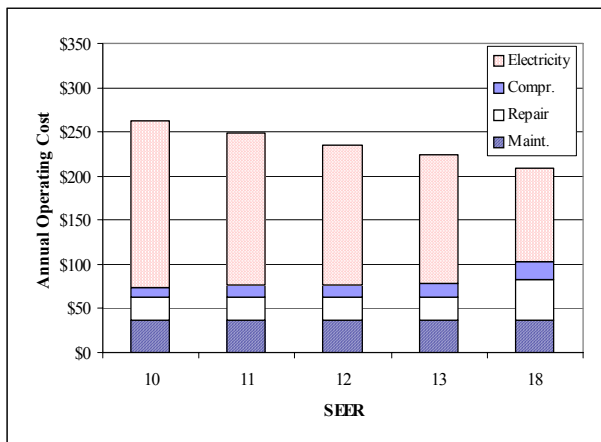


Figure 5.30S Split A/C: Mean Annual Operating Costs based on Rev Eng Manufacturing Costs



Figure 5.33S Split HP: Mean Annual Operating Costs based on Rev Eng Manufacturing Costs

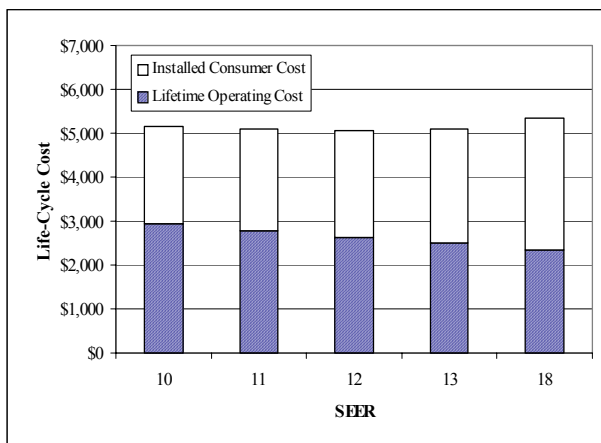


Figure 5.31S Split A/C: Mean Life-Cycle Costs based on Rev Eng Manufacturing Costs

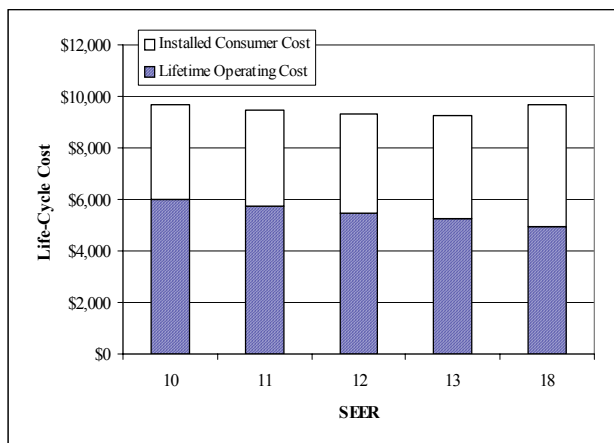


Figure 5.34S Split HP: Mean Life-Cycle Costs based on Rev Eng Manufacturing Costs

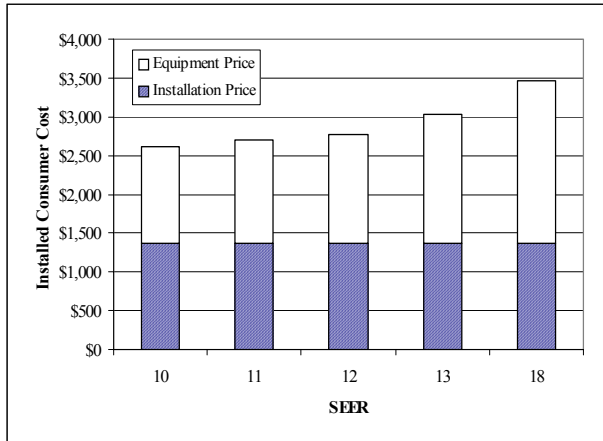


Figure 5.35S Pack A/C: Mean Installed Consumer Costs based on Rev Eng Manufacturing Costs

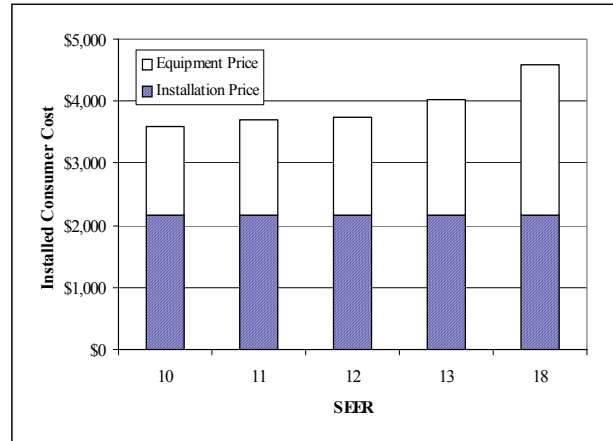


Figure 5.38S Pack HP: Mean Installed Consumer Costs based on Rev Eng Manufacturing Costs

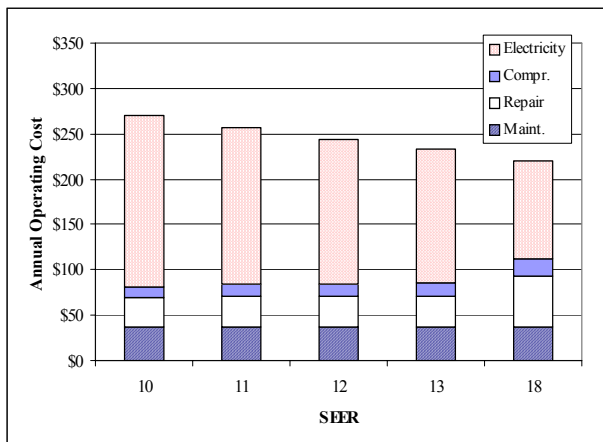


Figure 5.36S Pack A/C: Mean Annual Operating Costs based on Rev Eng Manufacturing Costs

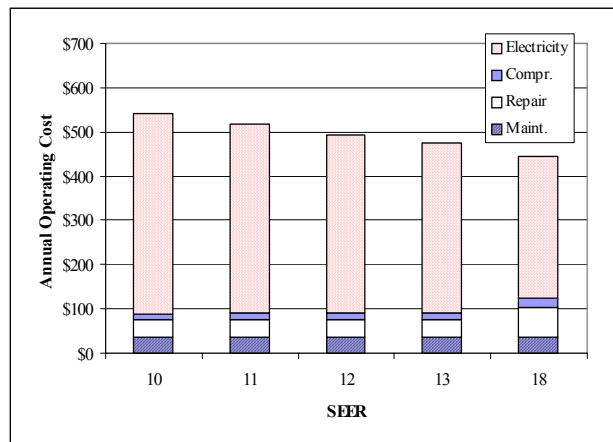


Figure 5.39S Pack HP: Mean Annual Operating Costs based on Rev Eng Manufacturing Costs

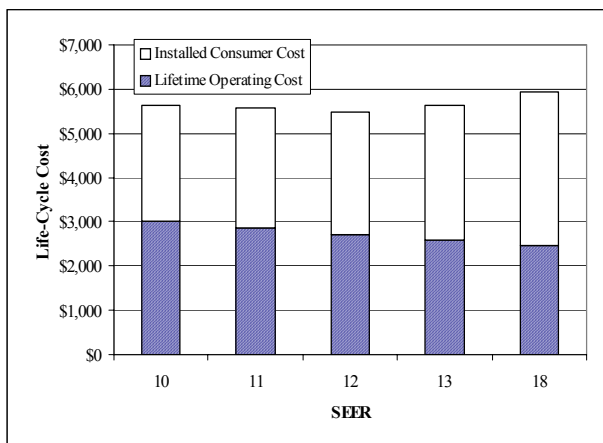


Figure 5.37S Pack A/C: Mean Life-Cycle Costs based on Rev Eng Manufacturing Costs

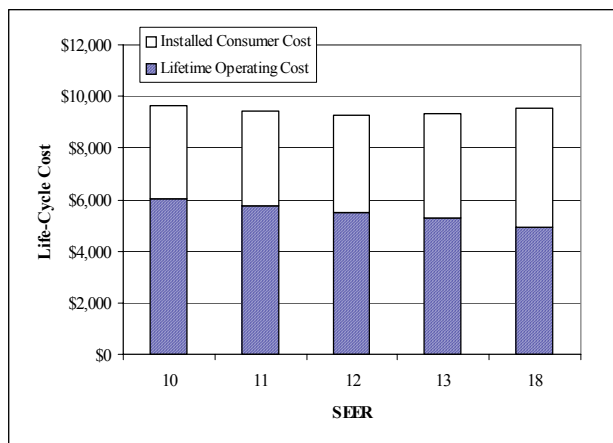


Figure 5.40S Pack HP: Mean Life-Cycle Costs based on Rev Eng Manufacturing Costs

Table 5.35S Summary of LCC Results for Split System Air Conditioners based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER)	Change in LCC from Baseline Shown by Percentiles of the Distribution of Results (values in 1998\$)												Percent of Households with reduced LCC
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean	
11	\$-2,060	\$-301	\$-160	\$-90	\$-44	\$-14	\$10	\$31	\$51	\$71	\$168	\$-75	56%
12	\$-4,382	\$-525	\$-276	\$-147	\$-64	\$-4	\$43	\$83	\$121	\$160	\$344	\$-113	51%
13	\$-4,372	\$-676	\$-345	\$-157	\$-46	\$35	\$99	\$155	\$206	\$262	\$530	\$-113	45%
18	\$-9,321	\$-922	\$-282	\$47	\$250	\$390	\$508	\$611	\$719	\$866	\$1,840	\$137	28%

Table 5.36S Summary of LCC Results for Split System Heat Pumps based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER)	Change in LCC from Baseline Shown by Percentiles of the Distribution of Results (values in 1998\$)												Percent of Households with reduced LCC
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean	
11 / 7.1	\$-1,676	\$-488	\$-332	\$-250	\$-192	\$-147	\$-109	\$-77	\$-45	\$-10	\$100	\$-209	92%
12 / 7.4	\$-3,205	\$-881	\$-597	\$-440	\$-334	\$-249	\$-179	\$-116	\$-59	\$10	\$234	\$-365	89%
13 / 7.7	\$-4,214	\$-1,106	\$-700	\$-484	\$-330	\$-216	\$-115	\$-28	\$58	\$145	\$484	\$-372	73%
18 / 8.8	\$-12,215	\$-1,333	\$-560	\$-148	\$131	\$347	\$514	\$659	\$817	\$1,012	\$1,947	\$41	35%

Table 5.37S Summary of LCC Results for Single Package Air Conditioners based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER)	Change in LCC from Baseline Shown by Percentiles of the Distribution of Results (values in 1998\$)												Percent of Households with reduced LCC
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean	
11	\$-2,179	\$-310	\$-172	\$-97	\$-49	\$-16	\$10	\$30	\$50	\$70	\$151	\$-78	56%
12	\$-4,756	\$-577	\$-329	\$-197	\$-111	\$-49	\$-3	\$37	\$73	\$109	\$226	\$-163	61%
13	\$-6,374	\$-650	\$-269	\$-79	\$48	\$129	\$192	\$249	\$303	\$364	\$611	\$-29	36%
18	\$-8,768	\$-779	\$-138	\$187	\$393	\$538	\$658	\$759	\$867	\$1,011	\$1,677	\$276	24%

Table 5.38S Summary of LCC Results for Single Package Heat Pumps based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER)	Change in LCC from Baseline Shown by Percentiles of the Distribution of Results (values in 1998\$)												Percent of Households with reduced LCC
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean	
11 / 7.1	\$-1,190	\$-520	\$-343	\$-253	\$-190	\$-143	\$-102	\$-67	\$-30	\$13	\$185	\$-207	87%
12 / 7.4	\$-3,373	\$-977	\$-681	\$-514	\$-399	\$-310	\$-233	\$-165	\$-95	\$-16	\$227	\$-421	92%
13 / 7.7	\$-4,405	\$-1,138	\$-712	\$-487	\$-318	\$-194	\$-89	\$9	\$107	\$219	\$613	\$-353	69%
18 / 8.8	\$-8,734	\$-1,689	\$-878	\$-416	\$-92	\$144	\$340	\$525	\$715	\$953	\$2,086	\$-166	44%

Table 5.53S Summary of Payback Period Results for Split Air Conditioners based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER)	Payback Period in Years Shown by Percentiles of the Distribution of Results											
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean
11	1	3	4	5	6	8	10	12	16	24	339	12
12	1	3	5	6	8	10	12	15	20	31	571	15
13	1	4	6	7	9	11	14	17	23	34	670	17
18	1	5	8	11	15	20	27	41	89	1000	>1000	174

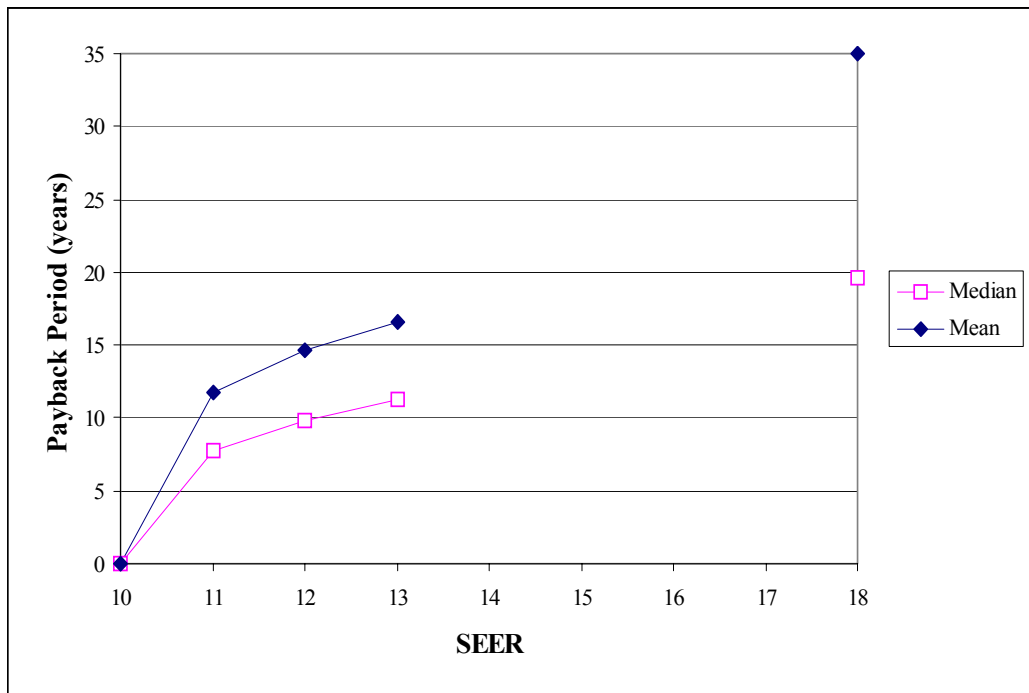


Figure 5.72S Split A/C: Median and Mean Payback Periods based on Reverse Engineering Manufacturing Costs

Table 5.54S Summary of Payback Period Results for Split Heat Pumps based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER / HSPF)	Payback Period in Years Shown by Percentiles of the Distribution of Results											
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean
11 / 7.1	0	1	2	2	2	3	3	4	5	7	1000	4
12 / 7.4	1	2	2	3	3	4	5	5	7	9	>1000	6
13 / 7.7	1	3	4	5	5	6	7	9	11	15	1000	9
18 / 8.8	2	5	7	9	11	14	17	22	32	62	>1000	78

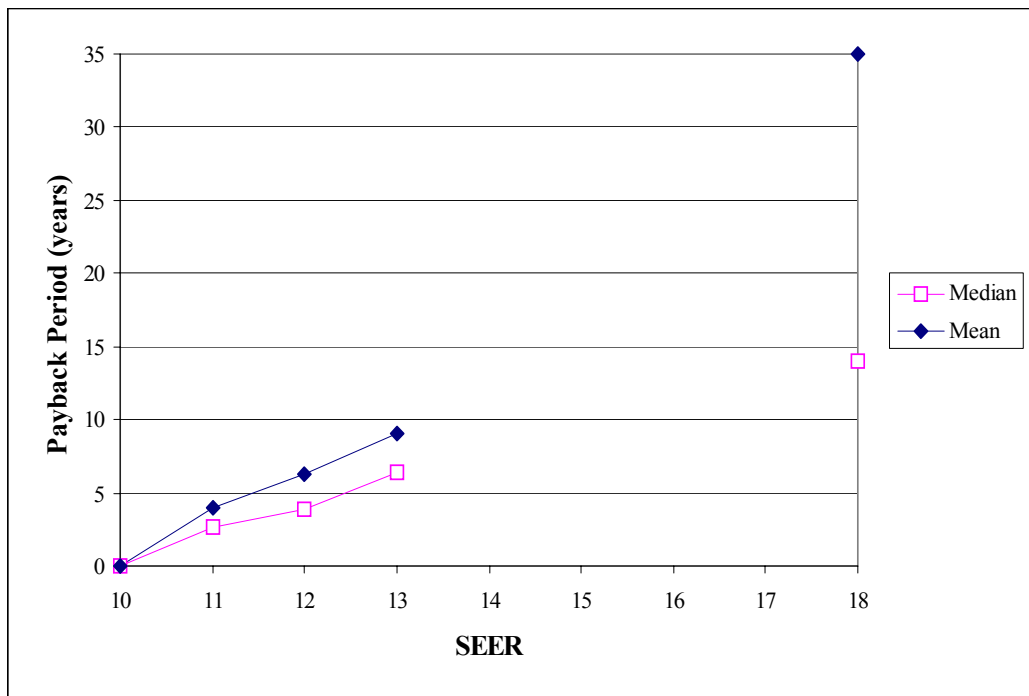


Figure 5.73S Split HP: Median and Mean Payback Periods based on Reverse Engineering Manufacturing Costs

Table 5.55S Summary of Payback Period Results for Single Package Air Conditioners based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER)	Payback Period in Years Shown by Percentiles of the Distribution of Results											
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean
11	1	3	4	5	6	8	10	12	16	24	299	11
12	1	3	4	5	6	8	9	12	16	24	591	11
13	1	5	7	9	12	15	18	22	30	46	>1000	22
18	1	6	9	13	18	25	35	57	163	1000	>1000	240

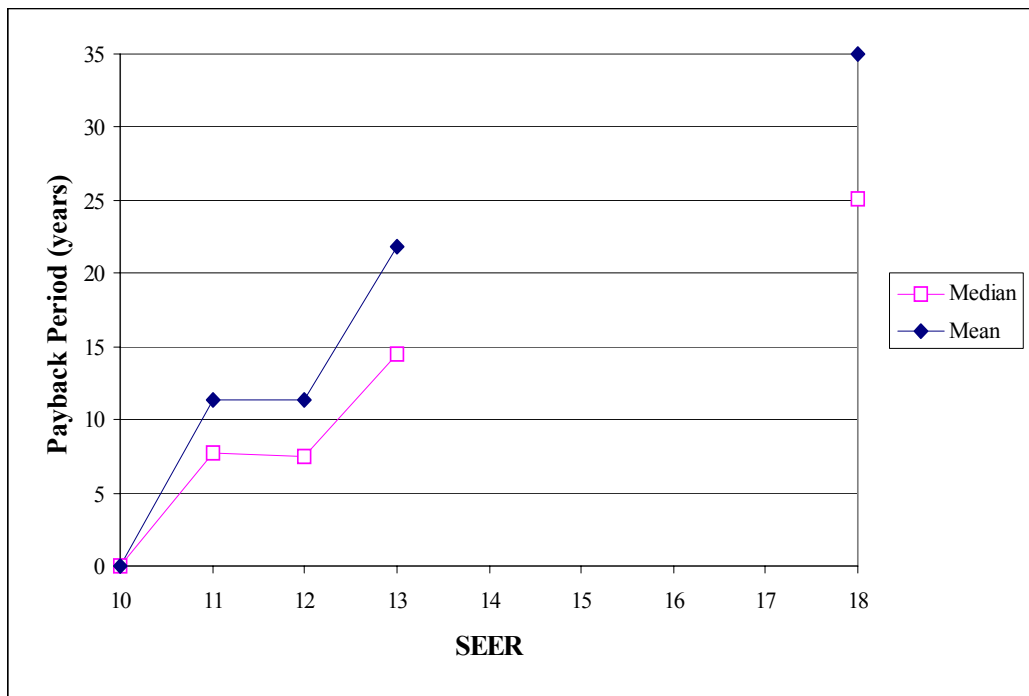


Figure 5.74S Package A/C: Median and Mean Payback Periods based on Reverse Engineering Manufacturing Costs

Table 5.56S Summary of Payback Period Results for Single Package Heat Pumps based on Reverse Engineering Manufacturing Costs

Efficiency Level (SEER / HSPF)	Payback Period in Years Shown by Percentiles of the Distribution of Results											
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Mean
11 / 7.1	1	2	3	3	4	5	5	6	7	11	>1000	7
12 / 7.4	1	2	2	3	3	4	5	6	7	10	1000	6
13 / 7.7	1	4	5	6	7	8	10	12	15	20	>1000	13
18 / 8.8	2	5	7	9	11	13	16	21	28	56	>1000	62

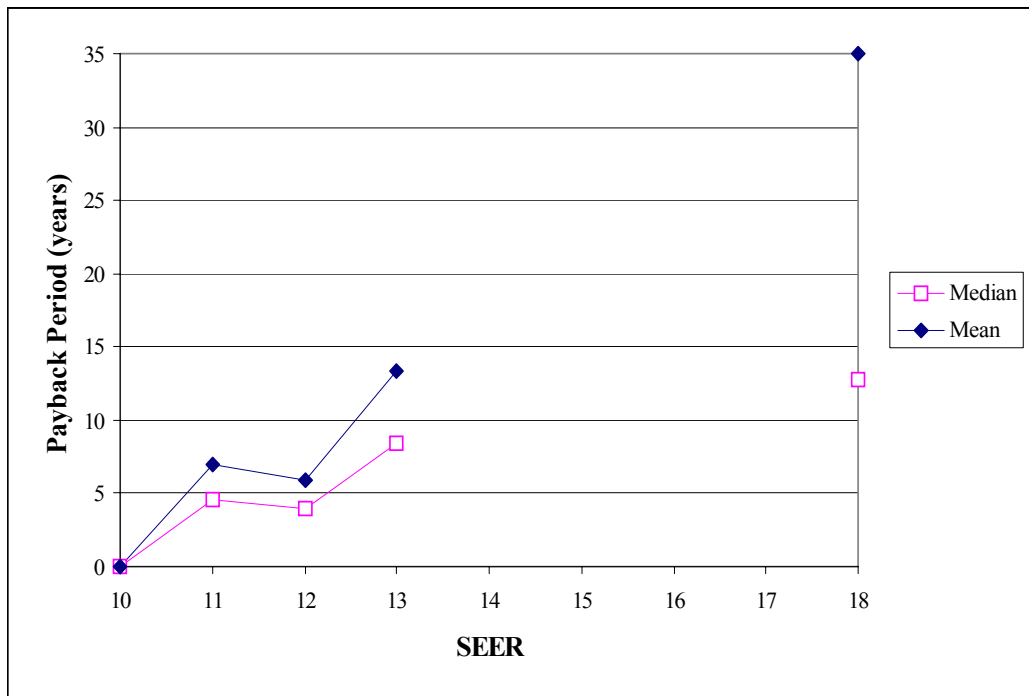


Figure 5.75S Package HP: Median and Mean Payback Periods based on Reverse Engineering Manufacturing Costs

Table 5.58S Summary of Rebuttable PBPs and Inputs for Split System Air Conditioners based on Reverse Engineering Manufacturing Costs

Effic'y Level SEER						Assumed 2006 Effic'y Distr.	Weighted-Avg of Units Sold below Effic'y		Rebutt. Payback Period years
	Installed Consumer Cost 1998\$	Annual Energy Use kWh/yr	Annual Repair Cost 1998\$	Annual Maint. Cost 1998\$	Annual Operating Expense 1998\$		Installed Consumer Cost 1998\$	Annual Operating Expense 1998\$	
10	\$2,236	3,600	\$26	\$36	\$357	78.7%	-	-	-
11	\$2,327	3,273	\$26	\$36	\$331	5.4%	\$2,236	\$357	3.5
12	\$2,449	3,000	\$27	\$36	\$310	12.0%	\$2,241	\$355	4.5
13	\$2,571	2,769	\$27	\$36	\$292	3.6%	\$2,267	\$350	5.2
18	\$2,990	2,000	\$46	\$36	\$250	0.2%	\$2,279	\$347	7.3

Table 5.59S Summary of Rebuttable PBPs and Inputs for Split System Heat Pumps based on Reverse Engineering Manufacturing Costs

Effic'y Level SEER/HSPF						Assumed 2006 Effic'y Distr.	Weighted-Avg of Units Sold below Effic'y		Rebutt. Payback Period years
	Installed Consumer Cost 1998\$	Annual Energy Use kWh/yr	Annual Repair Cost 1998\$	Annual Maint. Cost 1998\$	Annual Operating Expense 1998\$		Installed Consumer Cost 1998\$	Annual Operating Expense 1998\$	
10 / 6.8	\$3,668	11,844	\$38	\$36	\$894	59.3%	-	-	-
11 / 7.1	\$3,723	11,168	\$38	\$36	\$850	15.0%	\$3,668	\$894	1.3
12 / 7.4	\$3,812	10,575	\$38	\$36	\$812	19.7%	\$3,679	\$885	1.8
13 / 7.7	\$4,000	10,049	\$39	\$36	\$778	4.5%	\$3,707	\$870	3.2
18 / 8.8	\$4,707	8,370	\$66	\$36	\$697	0.5%	\$3,734	\$864	5.8

Table 5.60S Summary of Rebuttable PBPs and Inputs for Single Package Air Conditioners based on Reverse Engineering Manufacturing Costs

Effic'y Level SEER						Assumed 2006 Effic'y Distr.	Weighted-Avg of Units Sold below Effic'y		Rebutt. Payback Period years
	Installed Consumer Cost 1998\$	Annual Energy Use kWh/yr	Annual Repair Cost 1998\$	Annual Maint. Cost 1998\$	Annual Operating Expense 1998\$		Installed Consumer Cost 1998\$	Annual Operating Expense 1998\$	
10	\$2,607	3,600	\$34	\$36	\$365	82.3%	-	-	-
11	\$2,696	3,273	\$34	\$36	\$339	9.7%	\$2,607	\$365	3.5
12	\$2,765	3,000	\$34	\$36	\$318	6.8%	\$2,616	\$362	3.3
13	\$3,032	2,769	\$35	\$36	\$300	1.2%	\$2,627	\$359	6.8
18	\$3,466	2,000	\$57	\$36	\$261	0.0%	\$2,632	\$358	8.6

**Table 5.61S Summary of Rebuttable PBPs and Inputs for Single Package Heat Pumps
based on Reverse Engineering Manufacturing Costs**

Effc'y Level <i>SEER/HSPF</i>						Assumed 2006 Effc'y Distr.	Weighted-Avg of Units Sold below Effc'y		Rebutt. Payback Period <i>years</i>
	Installed Consumer Cost <i>1998\$</i>	Annual Energy Use <i>kWh/yr</i>	Annual Repair Cost <i>1998\$</i>	Annual Maint. Cost <i>1998\$</i>	Annual Operating Expense <i>1998\$</i>		Installed Consumer Cost <i>1998\$</i>	Annual Operating Expense <i>1998\$</i>	
10 / 6.8	\$3,599	11,844	\$39	\$36	\$895	64.2%	-	-	-
11 / 7.1	\$3,691	11,168	\$39	\$36	\$852	13.6%	\$3,599	\$895	2.1
12 / 7.4	\$3,748	10,575	\$40	\$36	\$814	22.2%	\$3,615	\$888	1.8
13 / 7.7	\$4,034	10,049	\$40	\$36	\$780	0.0%	\$3,645	\$871	4.3
18 / 8.8	\$4,584	8,370	\$66	\$36	\$696	0.0%	\$3,645	\$871	5.4

J.2 SUPPLEMENTAL TABLES AND FIGURES TO CHAPTER 7

Table 7.11S Cumulative NES Results based on Reverse Engineering Manufacturing Costs and AEO2000 Reference Case (2006 - 2030)

Trial Standard Level	Efficiency Scenario		
	NAECA	Roll-up	Shift
	<i>Quads</i>	<i>Quads</i>	<i>Quads</i>
1	1.7	1.5	1.9
2	3.0	2.9	3.5
3	3.5	3.4	3.9
4	4.3	4.2	4.7
5	8.6	8.8	8.6

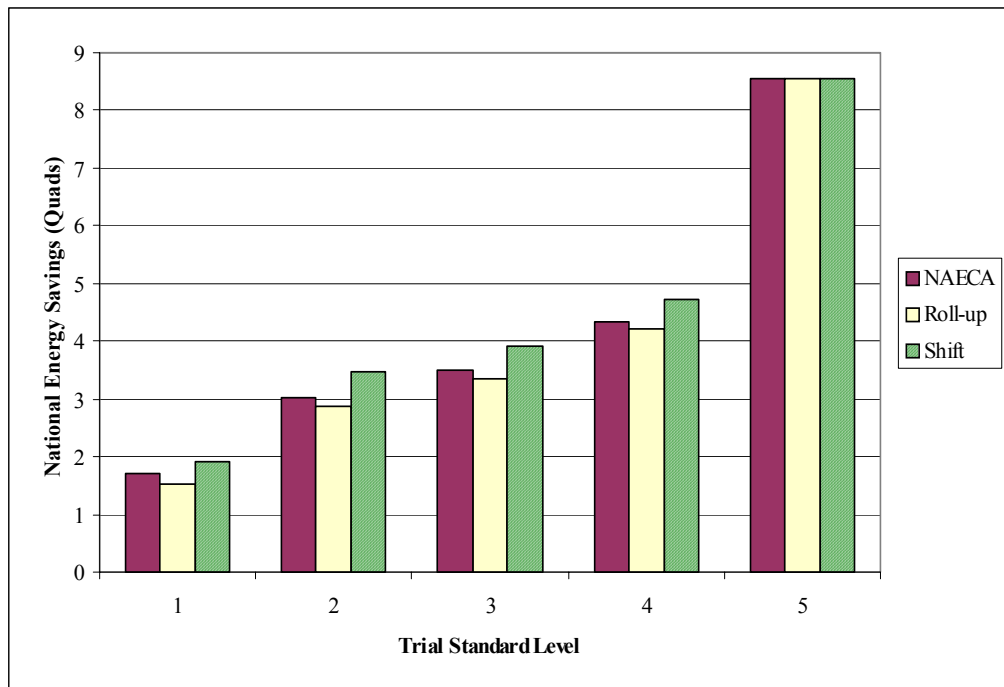


Figure 7.2S Cumulative NES Results based on Reverse Engineering Manufacturing Costs and AEO2000 Reference Case (2006-2030)

Table 7.12S Cumulative NES Results based on Reverse Engineering Manufacturing Costs and AEO2000 Low Growth Case (2006 - 2030)

Trial Standard Level	Efficiency Scenario		
	NAECA	Roll-up	Shift
	<i>Quads</i>	<i>Quads</i>	<i>Quads</i>
1	1.7	1.5	1.9
2	2.9	2.8	3.4
3	3.4	3.3	3.8
4	4.3	4.1	4.7
5	8.4	8.4	8.4

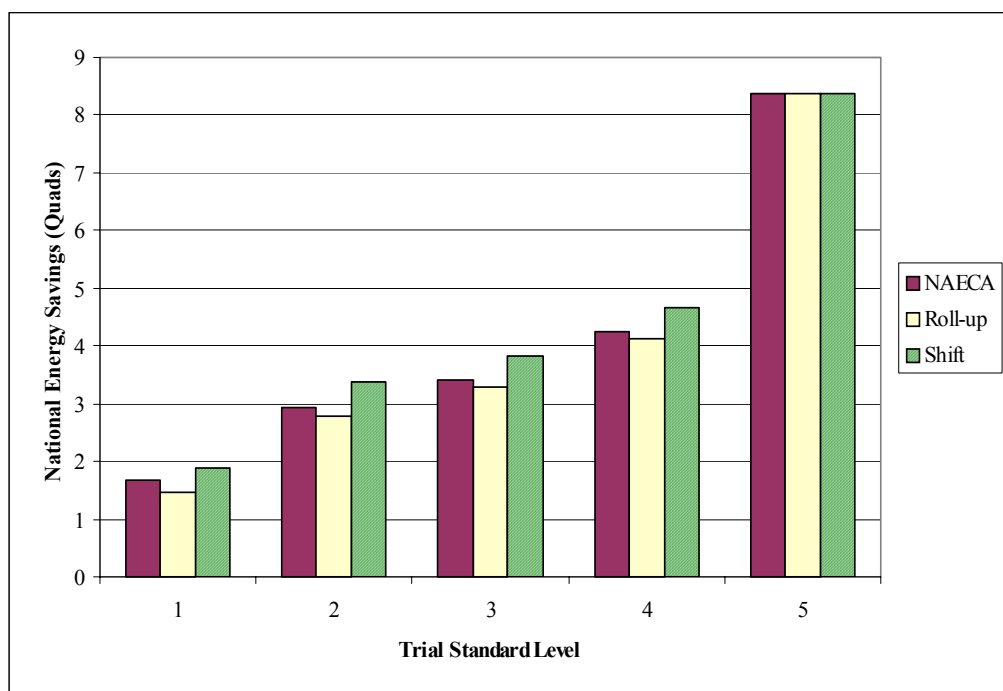


Figure 7.3S Cumulative NES Results based on Reverse Engineering Manufacturing Costs and AEO2000 Low Growth Case (2006-2030)

Table 7.13S Cumulative NES Results based on Reverse Engineering Manufacturing Costs and AEO2000 High Growth Case (2006 - 2030)

Trial Standard Level	Efficiency Scenario		
	NAECA	Roll-up	Shift
	<i>Quads</i>	<i>Quads</i>	<i>Quads</i>
1	1.8	1.6	2.0
2	3.2	3.0	3.6
3	3.7	3.5	4.1
4	4.6	4.4	5.0
5	9.0	9.0	9.0

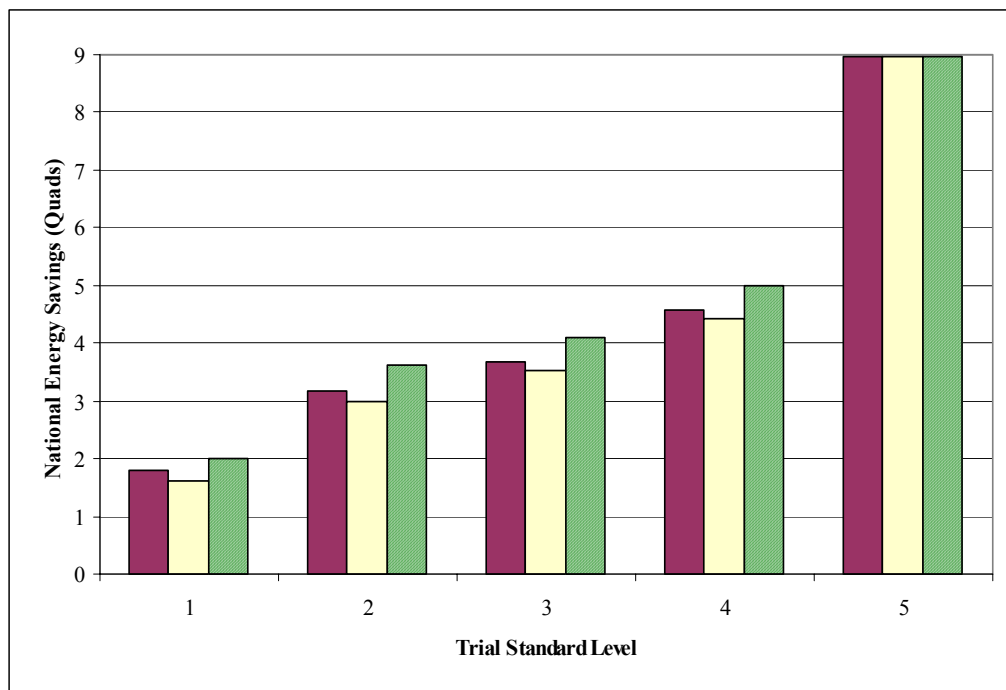


Figure 7.4S Cumulative NES Results based on Reverse Engineering Manufacturing Costs and AEO2000 High Growth Case (2006-2030)

Table 7.14S Cumulative NPV Results based on Reverse Engineering Manufacturing Costs and AEO2000 Reference Case (2006 - 2030)

TSL	Base Case Total billion 98\$	Efficiency Scenario								
		NAECA			Roll-up			Shift		
		Total	NPV		Total	NPV		Total	NPV	
		billion 98\$	billion 98\$	as % of Base Case Total	billion 98\$	billion 98\$	as % of Base Case Total	billion 98\$	billion 98\$	as % of Base Case Total
1	\$379	\$378	\$2	0.4%	\$377	\$2	0.5%	\$378	\$1	0.4%
2	\$379	\$377	\$2	0.5%	\$377	\$3	0.7%	\$380	(\$1)	-0.2%
3	\$379	\$378	\$1	0.4%	\$377	\$2	0.6%	\$381	(\$2)	-0.5%
4	\$379	\$379	\$0	0.0%	\$378	\$1	0.3%	\$383	(\$4)	-0.9%
5	\$379	\$390	(\$10)	-2.7%	\$390	(\$10)	-2.7%	\$390	(\$10)	-2.7%

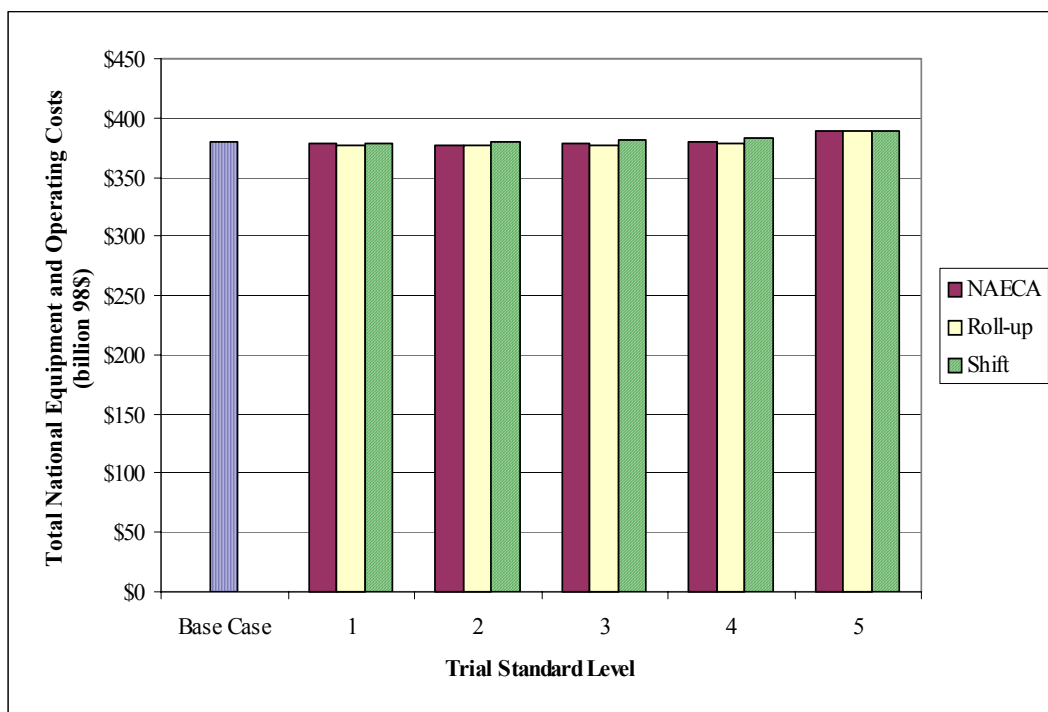


Figure 7.10S Cumulative Total National Equipment and Operating Costs based on Reverse Engineering Manufacturing Costs and AEO2000 Reference Case (2006 - 2030)

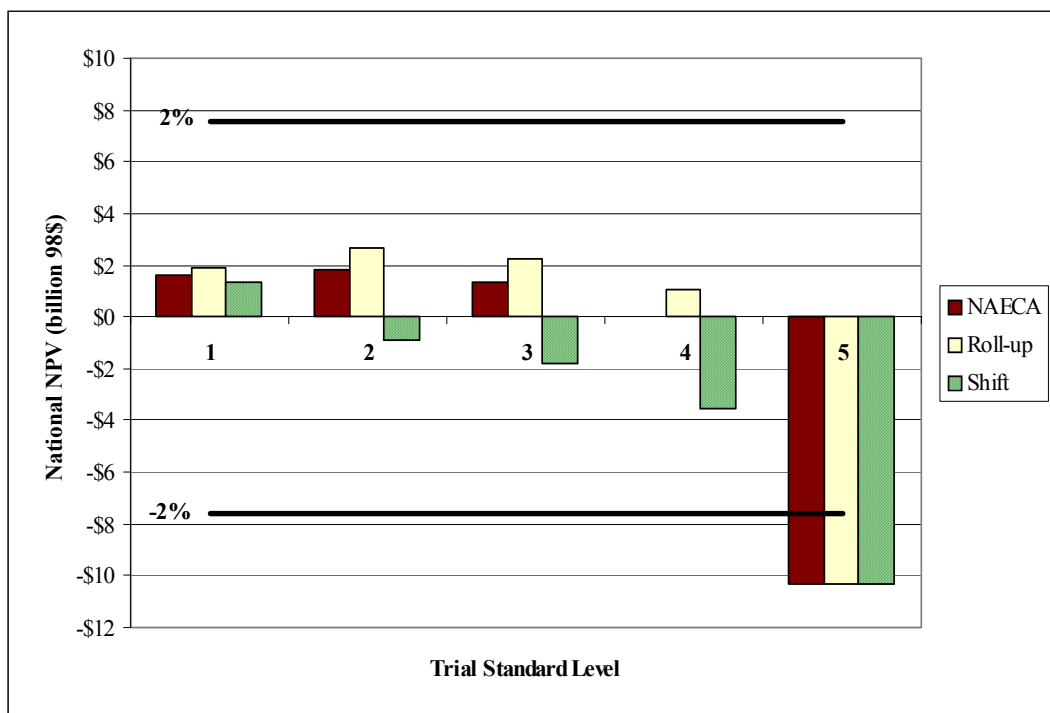


Figure 7.11S Cumulative NPVs relative to $\pm 2\%$ of Total National Base Case Costs based on Reverse Engineering Manufacturing Costs and *AEO2000* Reference Case (2006 - 2030)

Table 7.15S Cumulative NPV Results based on Reverse Engineering Manufacturing Costs and AEO2000 Low Growth Case (2006 -2030)

TSL	Base Case Total billion 98\$	Efficiency Scenario								
		NAECA			Roll-up			Shift		
		Total	NPV	as % of	Total	NPV	as % of	Total	NPV	as % of
		billion 98\$	billion 98\$	Base Case Total	billion 98\$	billion 98\$	Base Case Total	billion 98\$	billion 98\$	Base Case Total
1	\$367	\$366	\$1	0.4%	\$365	\$2	0.5%	\$366	\$1	0.3%
2	\$367	\$366	\$1	0.4%	\$365	\$2	0.6%	\$368	(\$1)	-0.3%
3	\$367	\$366	\$1	0.3%	\$365	\$2	0.5%	\$369	(\$2)	-0.5%
4	\$367	\$367	\$0	-0.1%	\$366	\$1	0.2%	\$371	(\$4)	-1.0%
5	\$367	\$378	(\$11)	-2.9%	\$378	(\$11)	-2.9%	\$378	(\$11)	-2.9%

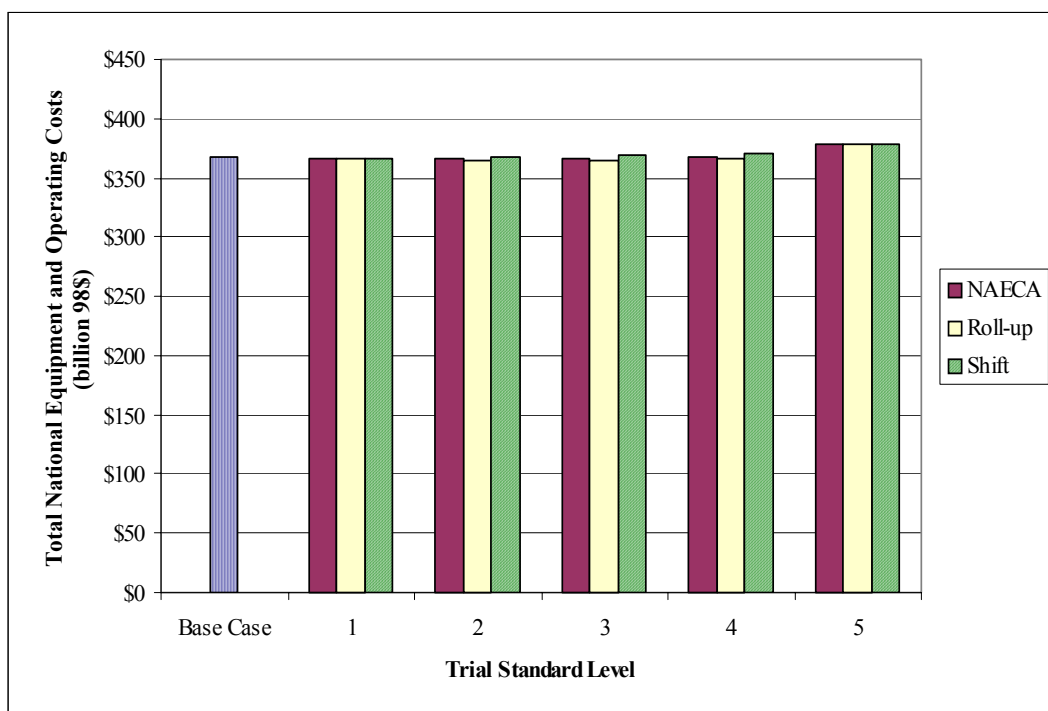


Figure 7.12S Cumulative Total National Equipment and Operating Costs based on Reverse Engineering Manufacturing Costs and AEO2000 Low Growth Case (2006 - 2030)

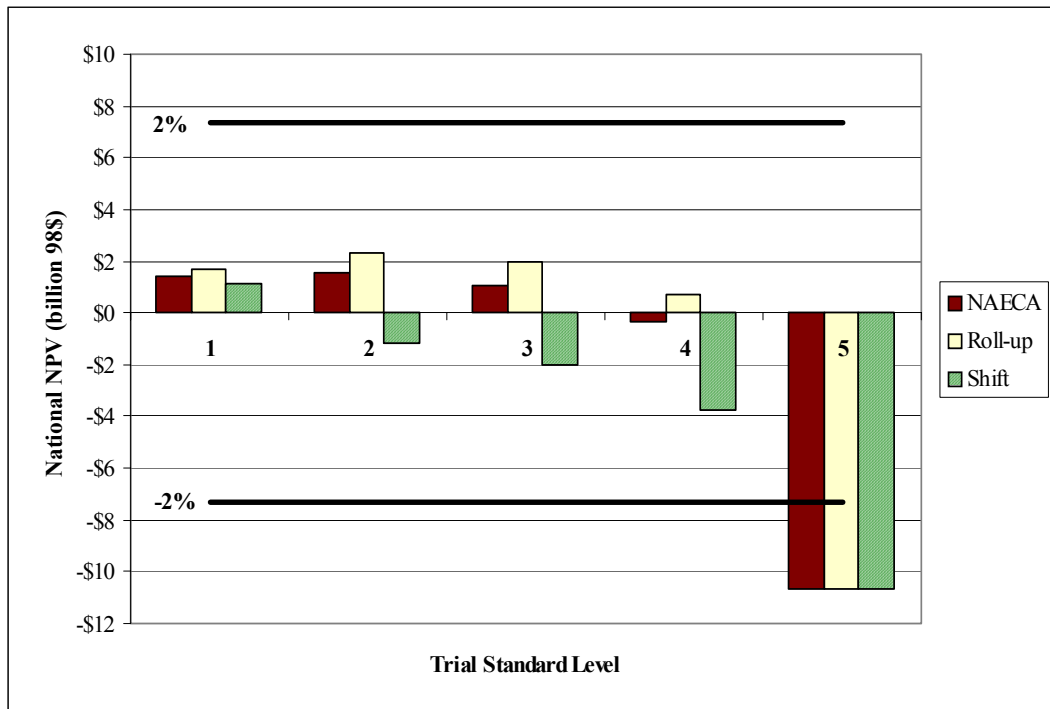


Figure 7.13S Cumulative National NPVs relative to $\pm 2\%$ of Total National Base Case Costs based on Reverse Engineering Manufacturing Costs and *AEO2000* Low Growth Case (2006 - 2030)

Table 7.16S Cumulative NPV Results based on Reverse Engineering Manufacturing Costs and AEO2000 High Growth Case (2006 -2030)

TSL	Base Case Total billion 98\$	Efficiency Scenario								
		NAECA			Roll-up			Shift		
		Total	NPV		Total	NPV		Total	NPV	
		billion 98\$	billion 98\$	as % of Base Case Total	billion 98\$	billion 98\$	as % of Base Case Total	billion 98\$	billion 98\$	as % of Base Case Total
1	\$402	\$400	\$2	0.5%	\$400	\$2	0.6%	\$400	\$2	0.4%
2	\$402	\$400	\$2	0.6%	\$399	\$3	0.8%	\$402	\$0	-0.1%
3	\$402	\$400	\$2	0.5%	\$399	\$3	0.7%	\$403	(\$1)	-0.3%
4	\$402	\$401	\$1	0.1%	\$400	\$2	0.4%	\$405	(\$3)	-0.8%
5	\$402	\$412	(\$10)	-2.4%	\$412	(\$10)	-2.4%	\$412	(\$10)	-2.4%

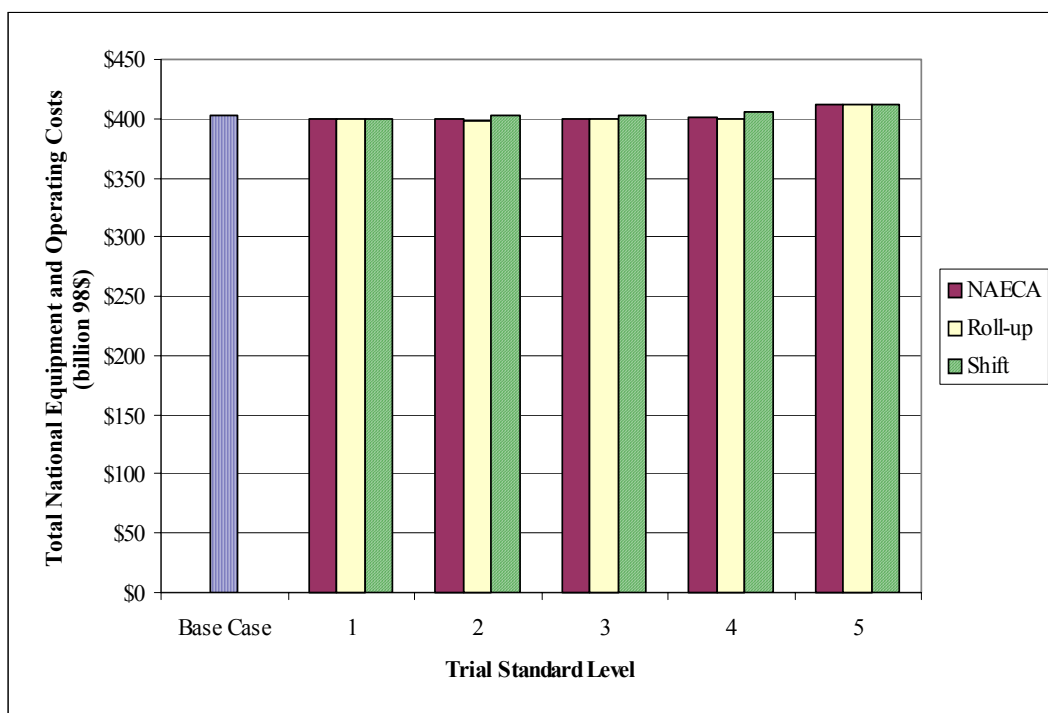


Figure 7.14S Cumulative Total National Equipment and Operating Costs based on Reverse Engineering Manufacturing Costs and AEO2000 High Growth Case (2006 - 2030)

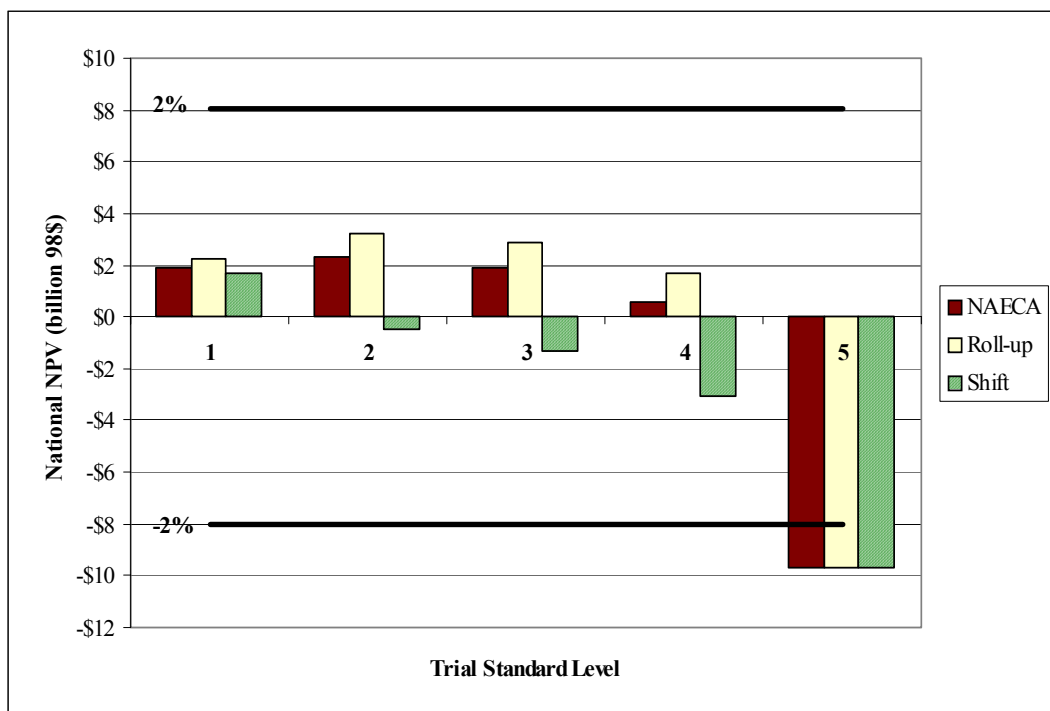


Figure 7.15S Cumulative National NPVs relative to $\pm 2\%$ of Total National Base Case Costs based on Reverse Engineering Manufacturing Costs and AEO2000 High Growth Case (2006 - 2030)

Table 7.19S Cumulative NPV Results based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario (2006 - 2030): 3% Discount Rate Scenario

TSL	Base Case Total <i>billion 98\$</i>	TSL Total <i>billion 98\$</i>	TSL NPV	
			<i>billion 98\$</i>	<i>as % of Base Case Total</i>
1	\$708	\$702	\$6	0.9%
2	\$708	\$698	\$10	1.4%
3	\$708	\$698	\$10	1.4%
4	\$708	\$699	\$9	1.2%
5	\$708	\$716	(\$8)	-1.2%

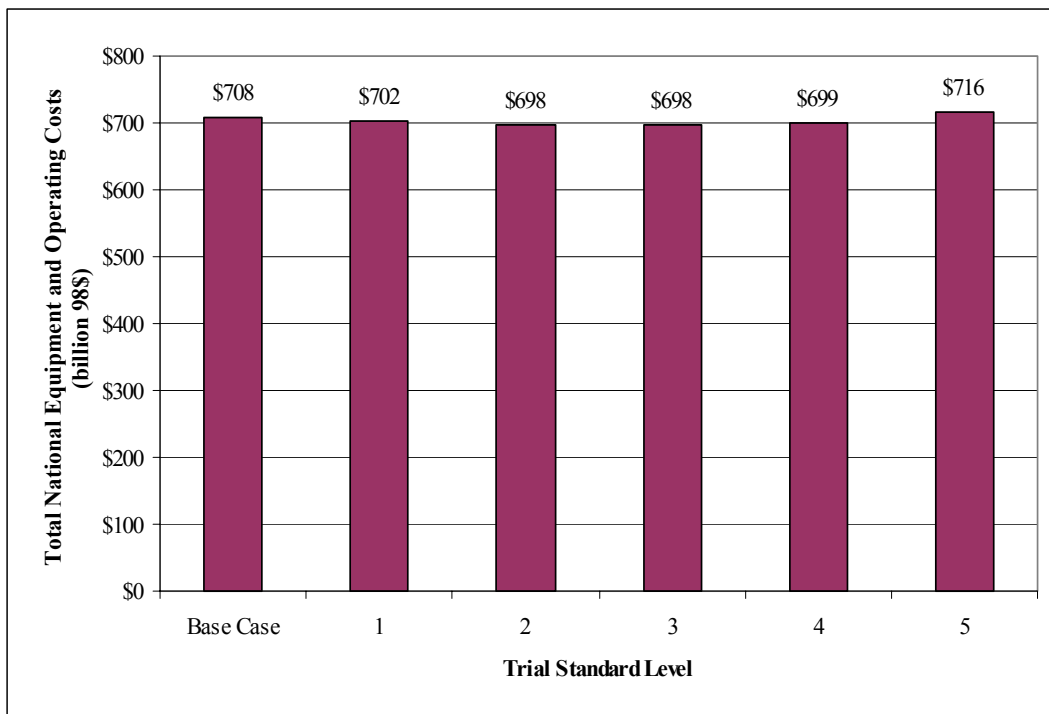


Figure 7.26S Cumulative Total National Equipment and Operating Costs based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario, and 3% Discount Rate Scenario (2006 - 2030)

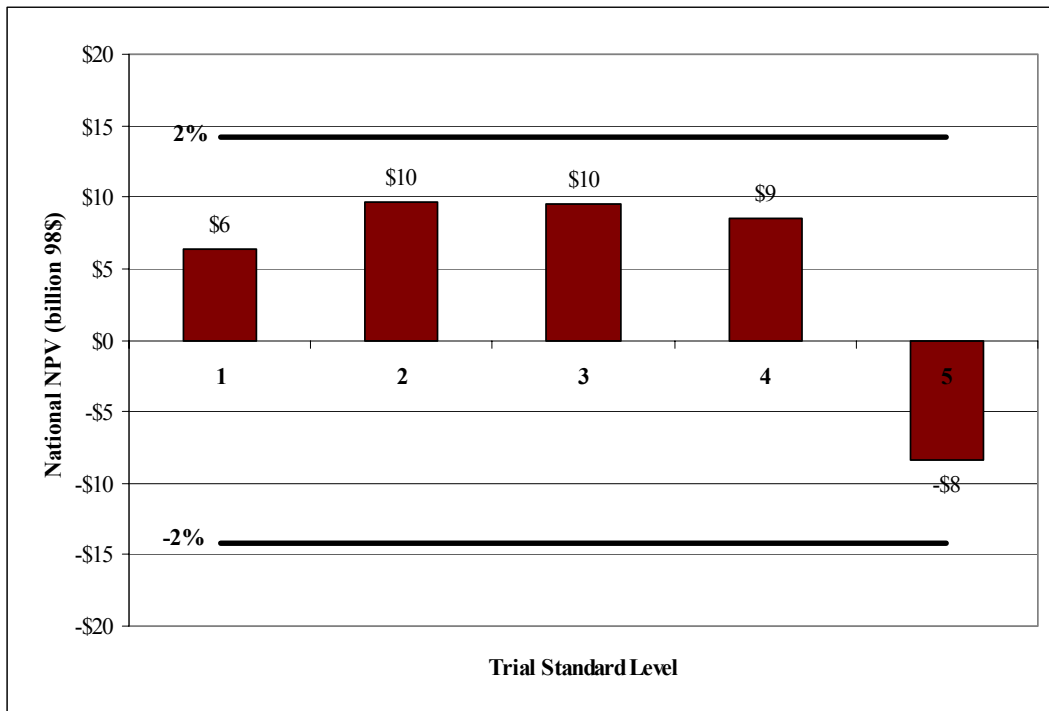


Figure 7.27S Cumulative National NPVs based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario, and 3% Discount Rate Scenario (2006 - 2030)

Table 7.19A Cumulative NPV Results based on Reverse Engineering Manufacturing Costs, Roll-up Efficiency Scenario (2006 - 2030): 3% Discount Rate Scenario

TSL	Base Case Total <i>billion 98\$</i>	TSL Total <i>billion 98\$</i>	TSL NPV	
			<i>billion 98\$</i>	<i>as % of Base Case Total</i>
1	\$708	\$701	\$7	0.9%
2	\$708	\$697	\$11	1.6%
3	\$708	\$697	\$11	1.6%
4	\$708	\$697	\$11	1.5%
5	\$708	\$716	(\$8)	-1.2%

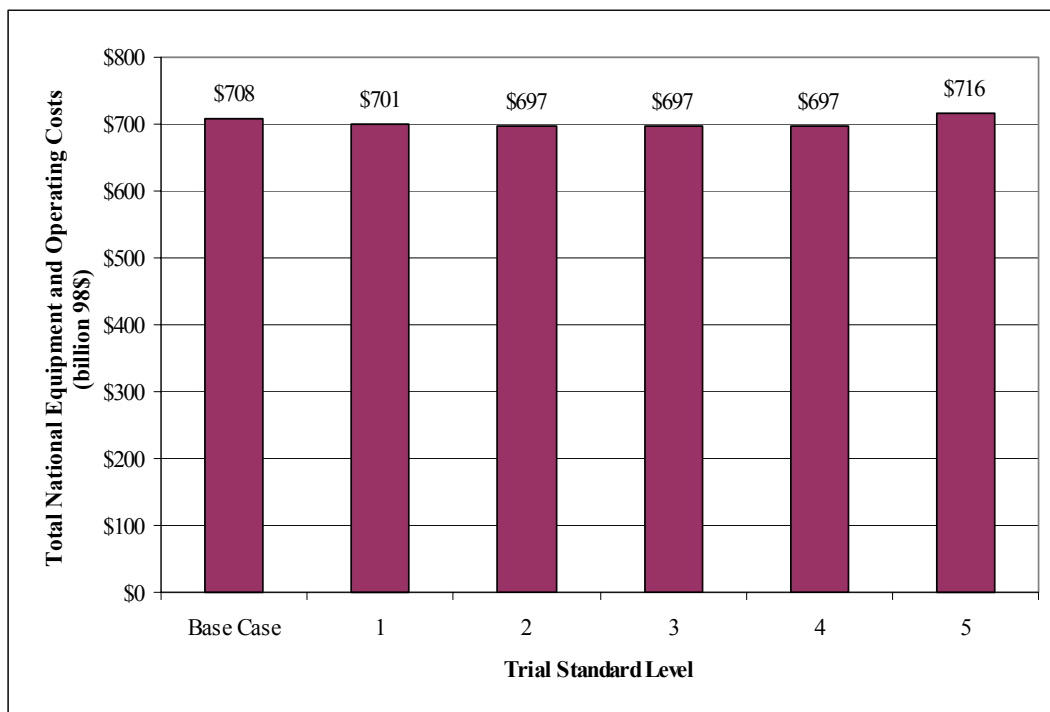


Table 7.26A Cumulative Total National Equipment and Operating Costs based on Reverse Engineering Manufacturing Costs, Roll-up Efficiency Scenario, and 3% Discount Rate Scenario (2006 - 2030)

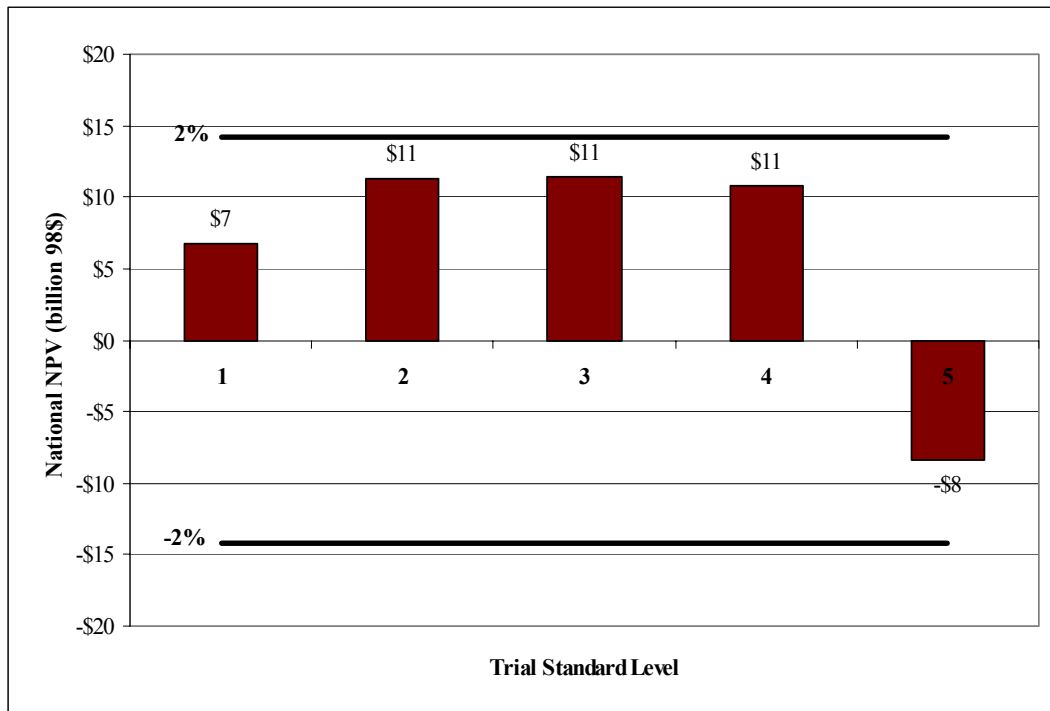


Table 7.27A Cumulative National NPVs based on Reverse Engineering Manufacturing Costs, Roll-up Efficiency Scenario, and 3% Discount Rate Scenario (2006 - 2030)

J.3 SUPPLEMENTAL TABLES TO CHAPTER 8

Table 8.14S Changes in Industry Net Present Value — Reverse Engineering Relative Cost, NAECA Efficiency Mix

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 1,539	--	--
1	\$ 1,509	\$ (30)	-2%
2	\$ 1,380	\$ (159)	-10%
3	\$ 1,368	\$ (171)	-11%
4	\$ 1,370	\$ (169)	-11%

Table 8.15S Changes in Industry Net Present Value — Reverse Engineering Relative Cost, Roll-up Efficiency Mix

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 1,539	--	--
1	\$ 1,379	\$ (160)	-10%
2	\$ 1,226	\$ (313)	-20%
3	\$ 1,220	\$ (319)	-21%
4	\$ 1,236	\$ (303)	-20%

Table 8.16S Changes in Industry Net Present Value — Reverse Engineering Relative Cost, Shift Efficiency Mix

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 1,539	--	--
1	\$ 1,658	\$ 119	8%
2	\$ 1,772	\$ 233	15%
3	\$ 1,776	\$ 237	15%
4	\$ 1,824	\$ 285	19%

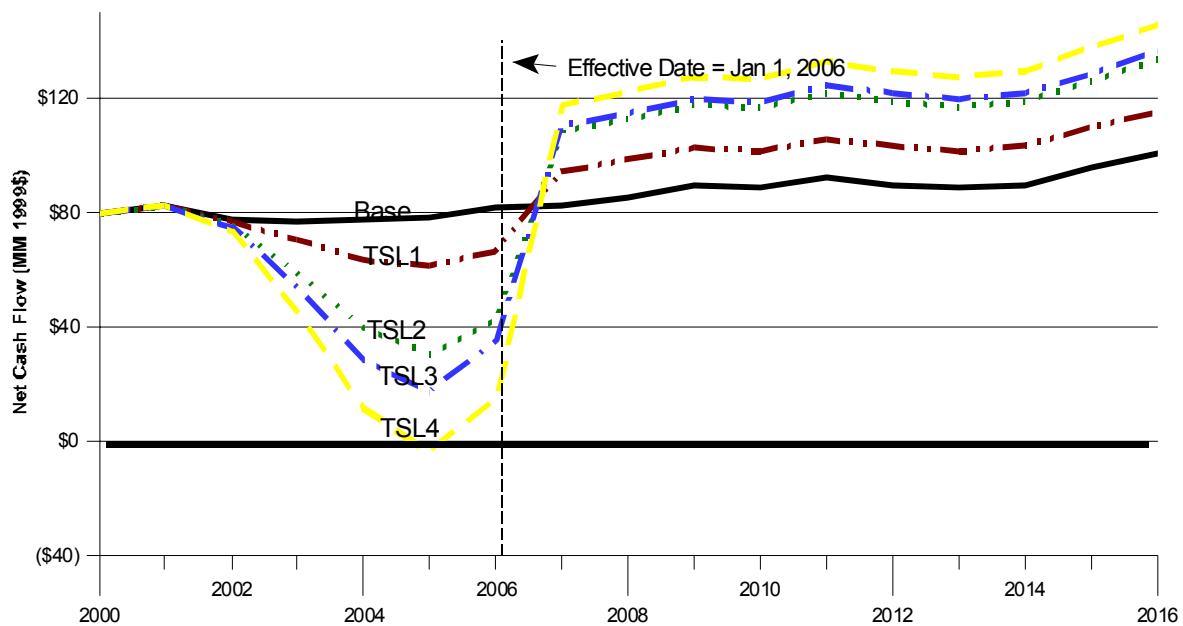


Figure 8.3S Industry Net Cash Flow – Reverse Engineering, Shift Efficiency Scenario

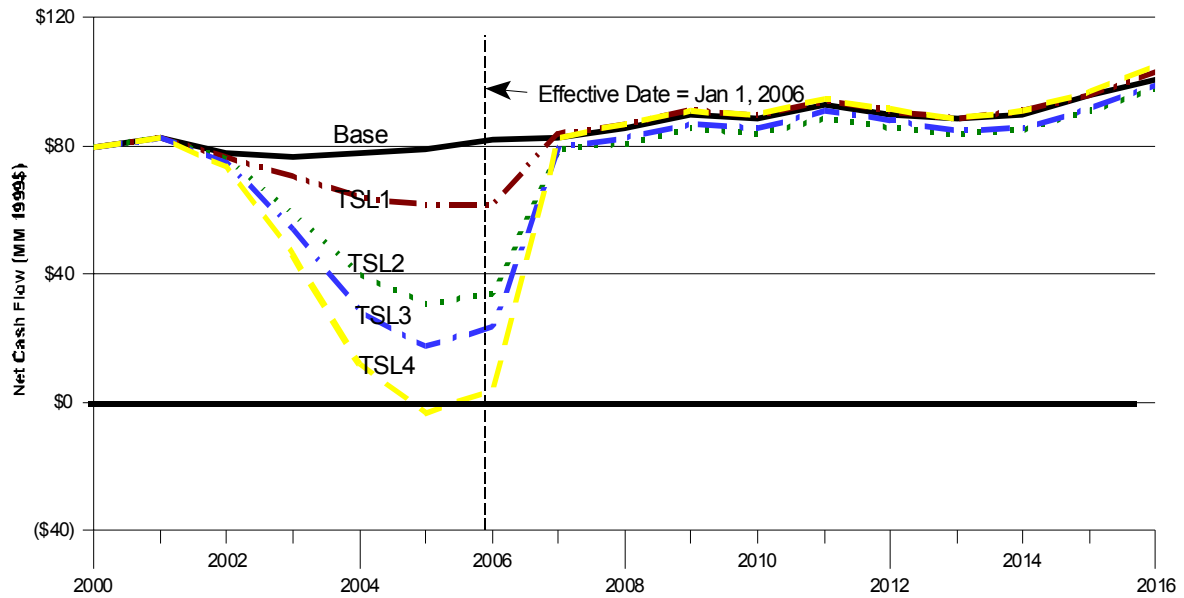


Figure 8.4S Industry Net Cash Flow – Reverse Engineering, NAECA Efficiency Scenario

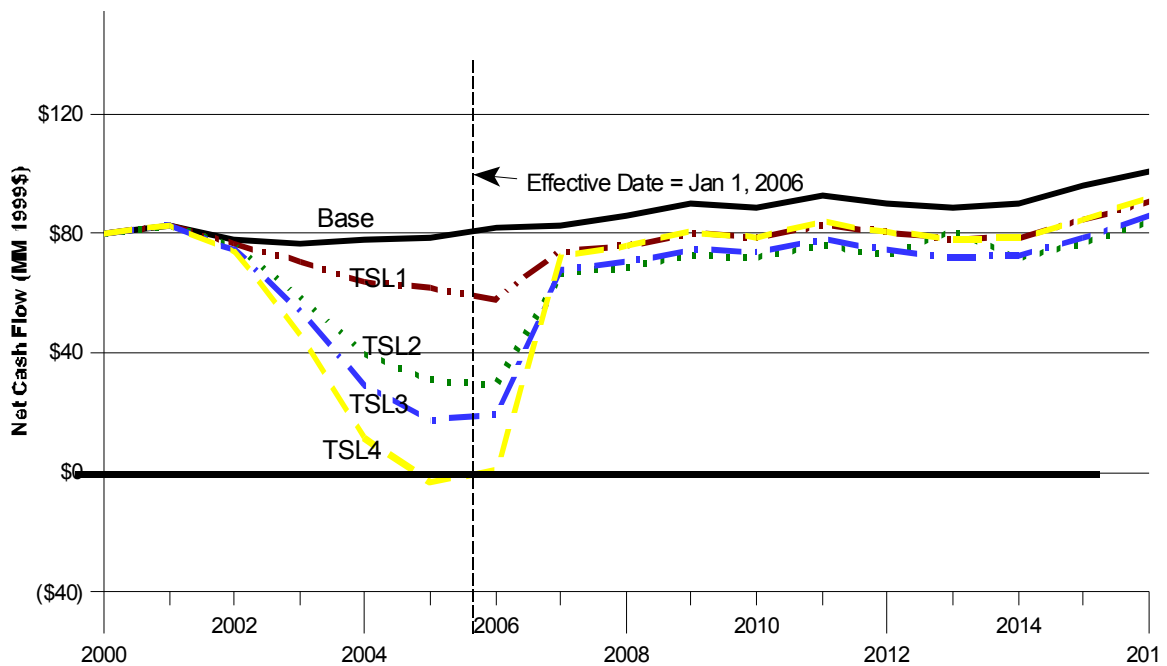


Figure 8.5S Industry Net Cash Flow – Reverse Engineering, Roll-up Efficiency Scenario

Table 8.29S Changes in Industry Net Present Value — Lower Operating Cost Subgroup, Reverse Engineering Relative Cost, NAECA Efficiency Scenario

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 368	--	--
1	\$ 385	\$ 17	5%
2	\$ 393	\$ 25	7%
3	\$ 397	\$ 29	8%
4	\$ 412	\$ 44	12%

Table 8.30S Changes in Industry Net Present Value — Lower Operating Cost Subgroup, Reverse Engineering Relative Cost, Roll-up Efficiency Mix

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 368	--	--
1	\$ 378	\$ 10	3%
2	\$ 385	\$ 17	5%
3	\$ 390	\$ 22	6%
4	\$ 405	\$ 37	10%

**Table 8.31S Changes in Industry Net Present Value — Lower Operating Cost Subgroup,
Reverse Engineering Relative Cost, Shift Efficiency Mix**

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 368	--	--
1	\$ 391	\$ 23	6%
2	\$ 414	\$ 46	13%
3	\$ 419	\$ 51	14%
4	\$ 437	\$ 69	19%

**Table 8.32S Changes in Industry Net Present Value — Higher Operating Cost Subgroup,
Reverse Engineering Relative Cost, NAECA Efficiency Scenario**

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 1,171	--	--
1	\$ 1,124	\$ (47)	-4%
2	\$ 987	\$ (184)	-16%
3	\$ 971	\$ (200)	-17%
4	\$ 958	\$ (213)	-18%

**Table 8.33S Changes in Industry Net Present Value — Higher Operating Cost Subgroup,
Reverse Engineering Relative Cost, Roll-up Efficiency Mix**

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 1,171	--	--
1	\$ 1,000	\$ (171)	-15%
2	\$ 841	\$ (330)	-28%
3	\$ 830	\$ (341)	-29%
4	\$ 831	\$ (340)	-29%

**Table 8.34S Changes in Industry Net Present Value — Higher Operating Cost Subgroup,
Reverse Engineering Relative Cost, Shift Efficiency Mix**

Standard Level	Industry Net Present Value (\$ million)	Change in INPV from Base Case	
		\$ million	percent
Base	\$ 1,171	--	--
1	\$ 1,267	\$ 96	8%
2	\$ 1,358	\$ 187	16%
3	\$ 1,357	\$ 186	16%
4	\$ 1,387	\$ 216	18%

Table 8.35S Changes in ROIC in 2011 — Lower Operating Cost Subgroup

Standard Level	Reverse Engineering NAECA		Reverse Engineering Roll-up		Reverse Engineering Shift	
	Return on Invested Capital (ROIC)	Change in ROIC from Base	Return on Invested Capital (ROIC)	Change in ROIC from Base	Return on Invested Capital (ROIC)	Change in ROIC from Base
Base	13.2%	--	13.2%	--	13.2%	--
1	13.6%	3%	13.5%	2%	13.9%	5%
2	13.4%	2%	13.2%	0%	14.1%	7%
3	13.5%	2%	13.2%	0%	14.1%	7%
4	13.6%	3%	13.4%	2%	14.3%	8%

Table 8.36S Changes in ROIC in 2011 — Higher Operating Cost Subgroup

Standard Level	Reverse Engineering NAECA		Reverse Engineering Roll-up		Reverse Engineering Shift	
	Return on Invested Capital (ROIC)	Change in ROIC from Base	Return on Invested Capital (ROIC)	Change in ROIC from Base	Return on Invested Capital (ROIC)	Change in ROIC from Base
Base	13.0%	--	13.0%	--	13.0%	--
1	12.2%	-6%	10.7%	-18%	14.0%	8%
2	10.2%	-22%	8.5%	-35%	14.4%	11%
3	10.0%	-23%	8.4%	-35%	14.2%	9%
4	9.7%	-25%	8.4%	-35%	14.1%	8%

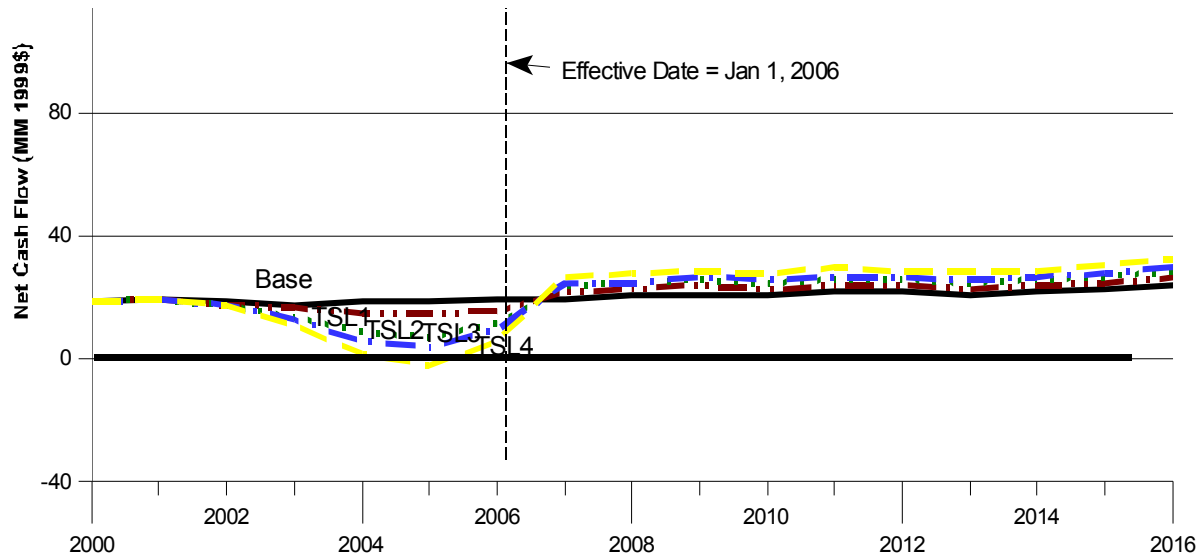


Figure 8.9S Net Cash Flows for the Lower Operating Cost Subgroup – Reverse Engineering, NAECA Efficiency Scenario

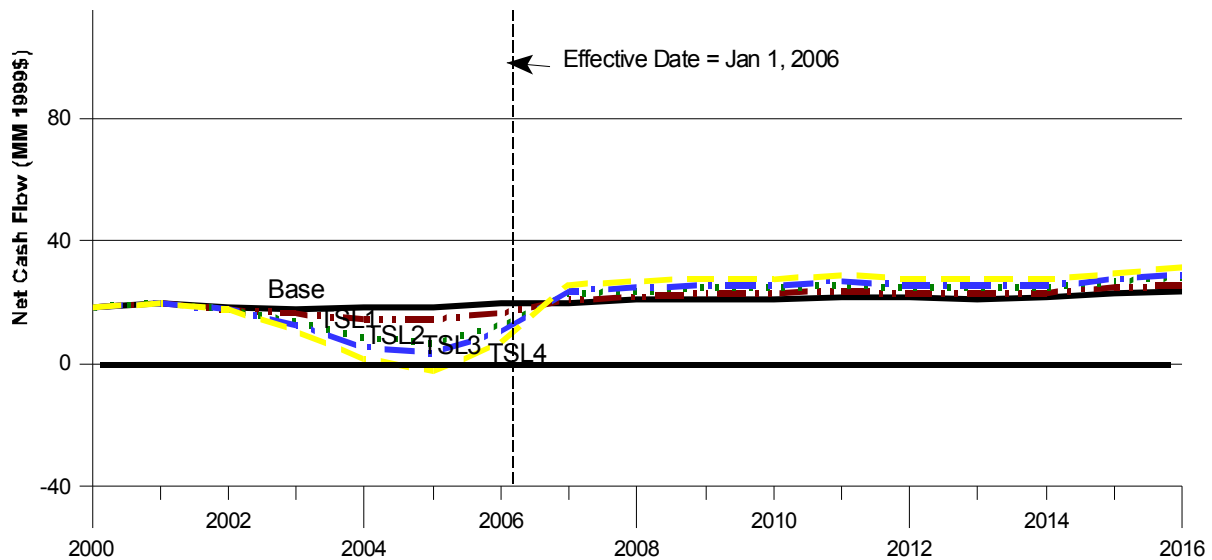


Figure 8.10S Net Cash Flows for the Lower Operating Cost Subgroup – Reverse Engineering, Roll-up Efficiency Scenario

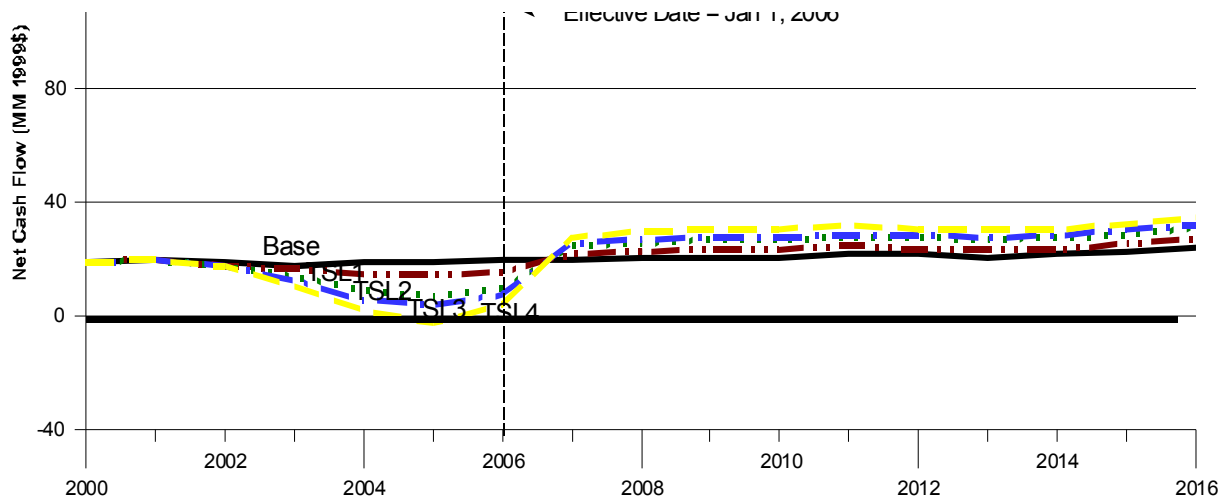


Figure 8.11S Net Cash Flows for the Lower Operating Cost Subgroup – Reverse Engineering, Shift Efficiency Scenario

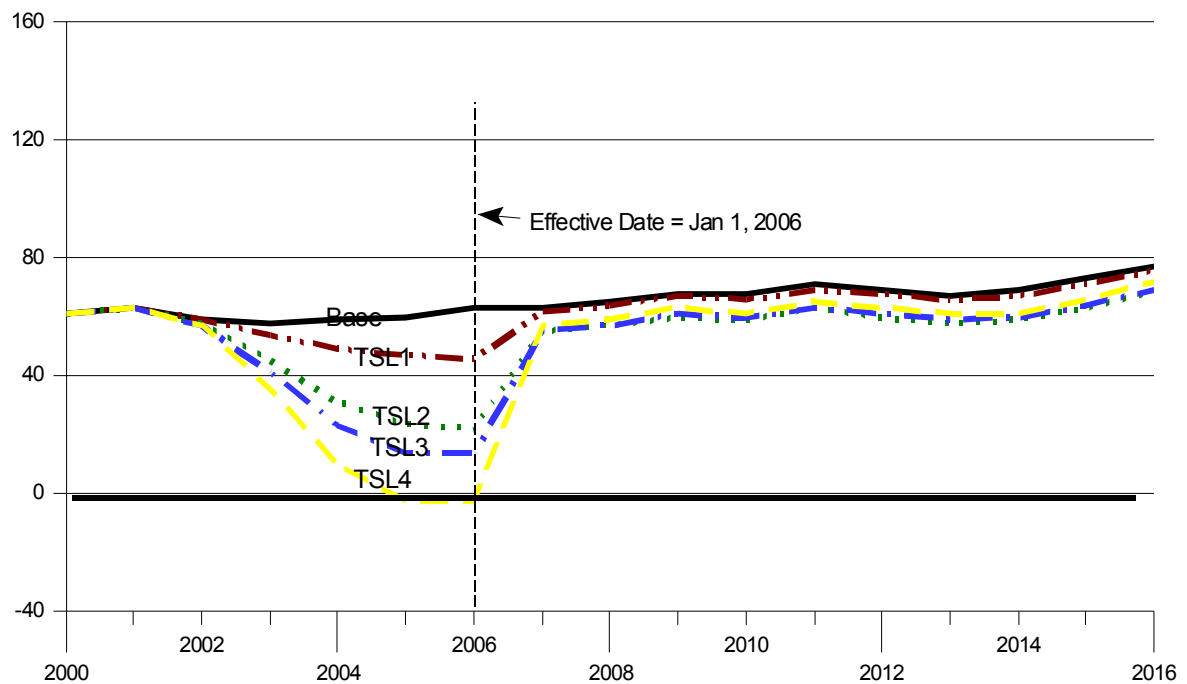


Figure 8.12S Net Cash Flows for the Higher Operating Cost Subgroup – Reverse Engineering, NAECA Efficiency Scenario

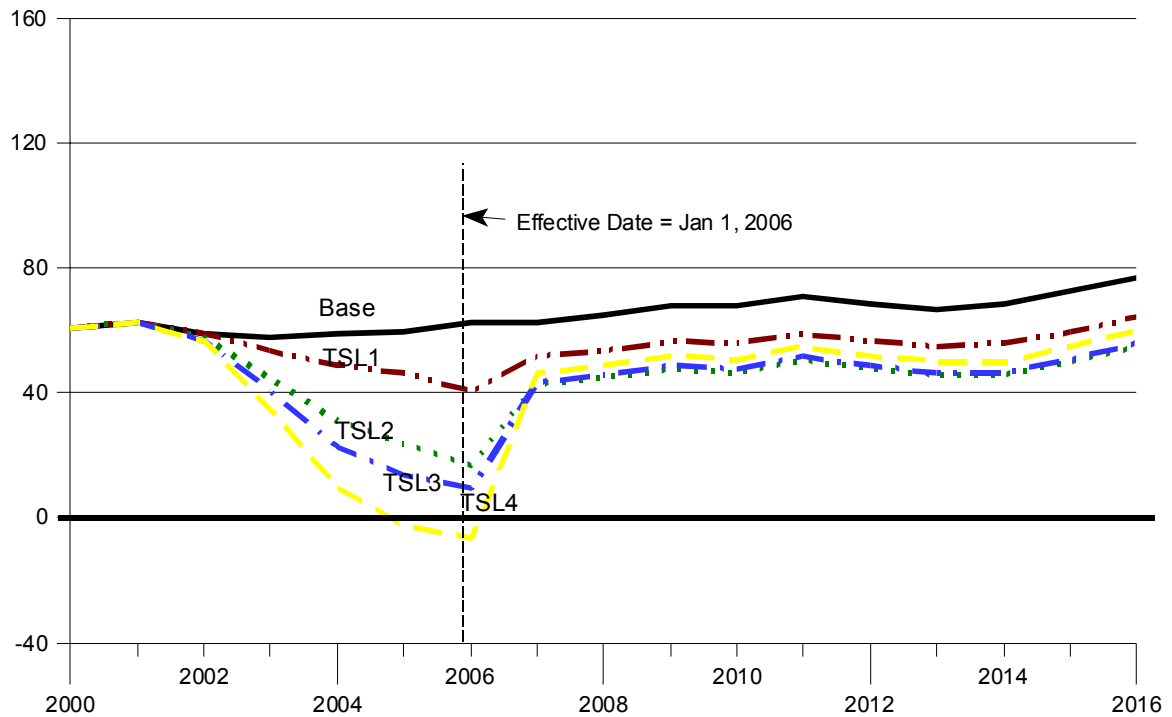


Figure 8.13S Net Cash Flows for the Higher Operating Cost Subgroup – Reverse Engineering, Roll-up Efficiency Scenario

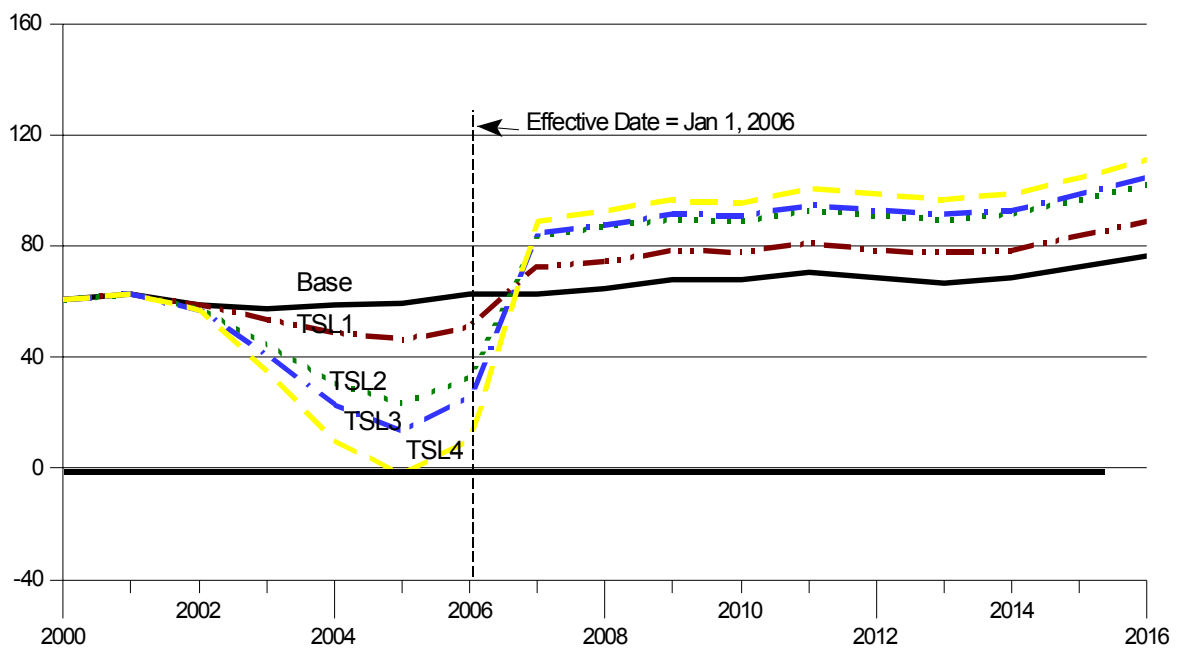


Figure 8.14S Net Cash Flows for the Higher Operating Cost Subgroup – Reverse Engineering, Shift Efficiency Scenario

J.4 SUPPLEMENTAL TABLES TO CHAPTER 10

Table 10.3S Split A/C: LCC Result Comparisons between Low-Income Households and Overall Sample based on Reverse Engineering Manufacturing Costs

Efficiency SEER	Low-Income Households					All Households and Commercial Buildings				
	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)
10	\$4,906	-	-	-	-	\$5,170	-	-	-	-
11	\$4,855	(\$51)	21%	74%	5%	\$5,095	(\$75)	28%	70%	2%
12	\$4,841	(\$65)	28%	38%	34%	\$5,057	(\$113)	35%	40%	25%
13	\$4,863	(\$43)	26%	24%	50%	\$5,057	(\$113)	34%	27%	39%
18	\$5,176	\$270	17%	6%	77%	\$5,307	\$137	25%	7%	68%

Table 10.4S Split Heat Pump: LCC Result Comparisons between Low-Income Households and Overall Sample based on Reverse Engineering Manufacturing Costs

Efficiency SEER	Low-Income Households					All Households and Commercial Buildings				
	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)
10	\$8,965	-	-	-	-	\$9,679	-	-	-	-
11	\$8,836	(\$129)	26%	74%	0%	\$9,470	(\$209)	40%	60%	0%
12	\$8,742	(\$223)	44%	56%	0%	\$9,314	(\$365)	58%	42%	0%
13	\$8,780	(\$185)	39%	49%	12%	\$9,307	(\$372)	52%	42%	6%
18	\$9,389	\$424	15%	10%	75%	\$9,720	\$41	28%	15%	57%

Table 10.5S Package A/C: LCC Result Comparisons between Low-Income Households and Overall Sample based on Reverse Engineering Manufacturing Costs

Efficiency SEER	Low-Income Households					All Households and Commercial Buildings				
	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)
10	\$5,327	-	-	-	-	\$5,629	-	-	-	-
11	\$5,272	(\$55)	21%	77%	2%	\$5,551	(\$78)	27%	72%	1%
12	\$5,202	(\$125)	34%	52%	14%	\$5,466	(\$163)	40%	51%	9%
13	\$5,364	\$37	21%	18%	61%	\$5,600	(\$29)	28%	20%	52%
18	\$5,704	\$377	15%	5%	80%	\$5,905	\$276	21%	6%	73%

Table 10.6S Package Heat Pump: LCC Result Comparisons between Low-Income Households and Overall Sample based on Reverse Engineering Manufacturing Costs

Efficiency SEER	Low-Income Households					All Households and Commercial Buildings				
	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)	Average LCC	Avg LCC (Savings) Costs	Net Savings (>2%)	No Signif. Impact	Net Costs (>2%)
10	\$9,149	-	-	-	-	\$9,626	-	-	-	-
11	\$9,031	(\$118)	24%	76%	0%	\$9,419	(\$207)	39%	61%	0%
12	\$8,884	(\$265)	52%	48%	0%	\$9,205	(\$421)	66%	34%	0%
13	\$9,001	(\$148)	36%	44%	20%	\$9,273	(\$353)	50%	38%	12%
18	\$9,433	\$284	20%	14%	66%	\$9,460	(\$166)	37%	15%	48%

J.5 SUPPLEMENTAL TABLES TO CHAPTER 11

Table 11.2S Standard Level 1 Forecast based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario

NEMS-BRS Results:						Difference from AEO2000 Reference							
											Extrapolation		
Residential Sector Energy Consumption						2000	2005	2010	2015	2020	2025	2030	
Electricity Sales (TWh)						1,185	1,281	1,375	1,454	1,539			
Total U.S. Electric Generation													
Coal (TWh)						1,930	2,127	2,171	2,249	2,341			
Gas (TWh)						601	717	998	1,289	1,467			
Petroleum (TWh)						90	68	53	47	45			
Nuclear (TWh)						688	674	627	511	427			
Renewables (TWh)						389	411	429	437	447			
Total (TWh)						3,698	3,997	4,278	4,533	4,727			
Installed Generating Capacity													
Coal (GW)						315.3	310.6	310.7	315.6	325.2			
Other Fossil (GW)						274.8	334.0	404.2	458.0	501.9			
Nuclear (GW)						97.5	93.4	84.1	67.4	57.0			
Renewables (GW)						94.7	98.5	101.7	103.8	105.7			
Total (GW)						782.3	836.5	900.6	944.8	989.8			
Residential Sector Energy Consumption						2000	2005	2010	2015	2020	2025	2030	
Electricity Sales (TWh)						0.0	0.0	-4.3	-9.8	-14.4	-17.5	-19.5	
Total U.S. Electric Generation													
Coal (TWh)						0.0	0.0	-1.1	-2.3	-6.1	-6.1	-6.1	
Gas (TWh)						0.0	0.0	-3.0	-8.3	-9.1	-9.1	-9.1	
Petroleum (TWh)						0.0	0.0	-0.5	0.2	0.9	0.9	0.9	
Nuclear (TWh)						0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Renewables (TWh)						0.0	0.0	0.0	0.1	0.0	0.0	0.0	
Total (TWh)						0.0	0.0	-4.6	-10.2	-14.3	-14.3	-14.3	
Installed Generating Capacity													
Coal (GW)						0.0	0.0	0.0	-0.2	-0.8	-0.8	-0.8	
Other Fossil (GW)						0.0	0.0	-0.5	-3.8	-5.7	-5.7	-5.7	
Nuclear (GW)						0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Renewables (GW)						0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total (GW)						0.0	0.0	-0.6	-4.0	-6.5	-6.5	-6.5	

Table 11.3S Standard Level 2 Forecast based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario

NEMS-BRS Results:						Difference from AEO2000 Reference						
												Extrapolation
<i>Residential Sector Energy Consumption</i>						2000	2005	2010	2015	2020	2025	2030
Electricity Sales (TWh)						1,185	1,281	1,371	1,447	1,527	-31.0	-34.6
<i>Total U.S. Electric Generation</i>												
Coal (TWh)						1,930	2,127	2,169	2,247	2,337	-10.3	-10.3
Gas (TWh)						601	717	997	1,283	1,460	-15.7	-15.7
Petroleum (TWh)						90	68	53	47	45	1.3	1.3
Nuclear (TWh)						688	674	627	511	427	0.0	0.0
Renewables (TWh)						389	411	429	437	447	-0.1	-0.1
Total (TWh)						3,698	3,997	4,275	4,525	4,716	-24.8	-24.8
<i>Installed Generating Capacity</i>												
Coal (GW)						315.3	310.6	310.7	315.4	324.7	-1.3	-1.3
Other Fossil (GW)						274.8	334.0	403.8	455.5	498.3	-9.3	-9.3
Nuclear (GW)						97.5	93.4	84.1	67.4	57.0	0.0	0.0
Renewables (GW)						94.7	98.5	101.7	103.8	105.7	0.0	0.0
Total (GW)						782.3	836.5	900.3	942.2	985.7	-10.6	-10.6

Table 11.4S Standard Level 3 Forecast based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario

NEMS-BRS Results:						Difference from AEO2000 Reference						
												Extrapolation
<i>Residential Sector Energy Consumption</i>						2000	2005	2010	2015	2020	2025	2030
Electricity Sales (TWh)						1,185	1,281	1,370	1,444	1,523	-36.1	-40.3
<i>Total U.S. Electric Generation</i>												
Coal (TWh)						1,930	2,127	2,169	2,246	2,335	-12.0	-12.0
Gas (TWh)						601	717	996	1,281	1,458	-18.2	-18.2
Petroleum (TWh)						90	68	53	47	45	1.5	1.5
Nuclear (TWh)						688	674	627	511	427	0.0	0.0
Renewables (TWh)						389	411	429	437	447	-0.1	-0.1
Total (TWh)						3,698	3,997	4,274	4,522	4,712	-28.8	-28.8
<i>Installed Generating Capacity</i>												
Coal (GW)						315.3	310.6	310.7	315.4	324.5	-1.5	-1.5
Other Fossil (GW)						274.8	334.0	403.7	454.5	496.8	-10.8	-10.8
Nuclear (GW)						97.5	93.4	84.1	67.4	57.0	0.0	0.0
Renewables (GW)						94.7	98.5	101.7	103.8	105.7	0.0	0.0
Total (GW)						782.3	836.5	900.1	941.1	983.9	-12.4	-12.4

Table 11.5S Standard Level 4 Forecast based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario

NEMS-BRS Results:						Difference from AEO2000 Reference					
<i>Residential Sector Energy Consumption</i>						<i>Residential Sector Energy Consumption</i>					
Electricity Sales (TWh)						Electricity Sales (TWh)					
2000	2005	2010	2015	2020		2000	2005	2010	2015	2020	Extrapolation 2025 2030
1,185	1,281	1,368	1,439	1,516		0.0	0.0	-10.9	-24.9	-36.9	-44.9 -50.2
<i>Total U.S. Electric Generation</i>						<i>Total U.S. Electric Generation</i>					
Coal (TWh)	1,930	2,127	2,171	2,245	2,332	Coal (TWh)	0.0	0.0	-1.1	-5.8	-14.7 -14.7 -14.7
Gas (TWh)	601	717	992	1,277	1,454	Gas (TWh)	0.0	0.0	-8.7	-20.3	-22.5 -22.5 -22.5
Petroleum (TWh)	90	68	53	47	46	Petroleum (TWh)	0.0	0.0	-1.0	0.5	2.0 2.0 2.0
Nuclear (TWh)	688	674	627	511	427	Nuclear (TWh)	0.0	0.0	0.0	0.0	0.0 0.0 0.0
Renewables (TWh)	389	411	429	437	447	Renewables (TWh)	0.0	0.0	-0.2	0.5	0.0 0.0 0.0
Total (TWh)	3,698	3,997	4,272	4,518	4,706	Total (TWh)	0.0	0.0	-11.0	-25.2	-35.2 -35.2 -35.2
<i>Installed Generating Capacity</i>						<i>Installed Generating Capacity</i>					
Coal (GW)	315.3	310.6	310.7	315.3	324.1	Coal (GW)	0.0	0.0	0.0	-0.5	-1.9 -1.9 -1.9
Other Fossil (GW)	274.8	334.0	403.4	452.5	494.0	Other Fossil (GW)	0.0	0.0	-1.3	-9.3	-13.6 -13.6 -13.6
Nuclear (GW)	97.5	93.4	84.1	67.4	57.0	Nuclear (GW)	0.0	0.0	0.0	0.0	0.0 0.0 0.0
Renewables (GW)	94.7	98.5	101.7	103.8	105.7	Renewables (GW)	0.0	0.0	0.0	0.0	0.0 0.0 0.0
Total (GW)	782.3	836.5	899.8	939.0	980.8	Total (GW)	0.0	0.0	-1.4	-9.8	-15.5 -15.5 -15.5

Figure 11.6S Standard Level 5 Forecast based on Reverse Engineering Manufacturing Costs, NAECA Efficiency Scenario

NEMS-BRS Results:						Difference from AEO2000 Reference						
												Extrapolation
						2000	2005	2010	2015	2020	2025	2030
<i>Residential Sector Energy Consumption</i>												
Electricity Sales (TWh)												
						1,185	1,281	1,358	1,416	1,480	-89.7	-100.8
<i>Total U.S. Electric Generation</i>												
Coal (TWh)						1,930	2,127	2,169	2,240	2,320	-26.7	-26.7
Gas (TWh)						601	717	986	1,261	1,437	-38.6	-38.6
Petroleum (TWh)						90	68	52	47	42	-2.2	-2.2
Nuclear (TWh)						688	674	627	511	427	0.0	0.0
Renewables (TWh)						389	411	429	437	448	0.5	0.5
Total (TWh)						3,698	3,997	4,263	4,496	4,674	-67.0	-67.0
<i>Installed Generating Capacity</i>												
Coal (GW)						315.3	310.6	310.6	314.8	322.4	-3.6	-3.6
Other Fossil (GW)						274.8	334.0	402.4	445.0	482.4	-25.2	-25.2
Nuclear (GW)						97.5	93.4	84.1	67.4	57.0	0.0	0.0
Renewables (GW)						94.7	98.5	101.7	103.8	105.6	-0.1	-0.1
Total (GW)						782.3	836.5	898.8	931.0	967.5	-28.8	-28.8

Table 11.7S Standard Level 4 Roll-up Forecast based on Reverse Engineering Manufacturing Costs

NEMS-BRS Results:						Difference from AEO2000 Reference					
<i>Residential Sector Energy Consumption</i>						<i>Residential Sector Energy Consumption</i>					
Electricity Sales (TWh)						Electricity Sales (TWh)					
2000	2005	2010	2015	2020		2000	2005	2010	2015	2020	Extrapolation 2025 2030
1,185	1,281	1,368	1,440	1,517		0.0	0.0	-10.6	-24.2	-35.8	-43.6 -48.7
<i>Total U.S. Electric Generation</i>						<i>Total U.S. Electric Generation</i>					
Coal (TWh)	1,930	2,127	2,170	2,245	2,332	Coal (TWh)	0.0	0.0	-1.7	-5.9	-14.9 -14.9
Gas (TWh)	601	717	993	1,277	1,454	Gas (TWh)	0.0	0.0	-7.8	-19.9	-22.1 -22.1
Petroleum (TWh)	90	68	53	47	46	Petroleum (TWh)	0.0	0.0	-1.2	0.2	2.0 2.0
Nuclear (TWh)	688	674	627	511	427	Nuclear (TWh)	0.0	0.0	0.0	0.0	0.0 0.0
Renewables (TWh)	389	411	429	437	447	Renewables (TWh)	0.0	0.0	-0.2	0.4	0.0 0.0
Total (TWh)	3,698	3,997	4,272	4,518	4,706	Total (TWh)	0.0	0.0	-11.0	-25.3	-34.9 -34.9
<i>Installed Generating Capacity</i>						<i>Installed Generating Capacity</i>					
Coal (GW)	315.3	310.6	310.7	315.3	324.1	Coal (GW)	0.0	0.0	0.0	-0.5	-1.9 -1.9
Other Fossil (GW)	274.8	334.0	403.4	452.7	494.1	Other Fossil (GW)	0.0	0.0	-1.3	-9.1	-13.5 -13.5
Nuclear (GW)	97.5	93.4	84.1	67.4	57.0	Nuclear (GW)	0.0	0.0	0.0	0.0	0.0 0.0
Renewables (GW)	94.7	98.5	101.7	103.8	105.7	Renewables (GW)	0.0	0.0	0.0	0.0	0.0 0.0
Total (GW)	782.3	836.5	899.8	939.2	980.8	Total (GW)	0.0	0.0	-1.4	-9.6	-15.5 -15.5

Table 11.8S Standard Level 4 Shift Forecast based on Reverse Engineering Manufacturing Costs

NEMS-BRS Results:						Difference from AEO2000 Reference							
						2000					Extrapolation		
						2000	2005	2010	2015	2020	2025	2030	
Residential Sector Energy Consumption						Residential Sector Energy Consumption							
Electricity Sales (TWh)						Electricity Sales (TWh)	0.0	0.0	-11.8	-27.1	-40.2	-49.1	-54.9
Total U.S. Electric Generation						Total U.S. Electric Generation							
Coal (TWh)	1,930	2,127	2,169	2,245	2,331	Coal (TWh)	0.0	0.0	-2.7	-6.2	-16.0	-16.0	-16.0
Gas (TWh)	601	717	993	1,276	1,452	Gas (TWh)	0.0	0.0	-7.7	-21.4	-23.8	-23.8	-23.8
Petroleum (TWh)	90	68	53	47	46	Petroleum (TWh)	0.0	0.0	-1.3	0.3	2.0	2.0	2.0
Nuclear (TWh)	688	674	627	511	427	Nuclear (TWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (TWh)	389	411	429	437	447	Renewables (TWh)	0.0	0.0	-0.1	0.3	0.0	0.0	0.0
Total (TWh)	3,698	3,997	4,271	4,516	4,703	Total (TWh)	0.0	0.0	-11.8	-26.9	-37.8	-37.8	-37.8
Installed Generating Capacity						Installed Generating Capacity							
Coal (GW)	315.3	310.6	310.7	315.2	323.9	Coal (GW)	0.0	0.0	0.0	-0.6	-2.1	-2.1	-2.1
Other Fossil (GW)	274.8	334.0	403.4	452.1	493.2	Other Fossil (GW)	0.0	0.0	-1.3	-9.7	-14.4	-14.4	-14.4
Nuclear (GW)	97.5	93.4	84.1	67.4	57.0	Nuclear (GW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (GW)	94.7	98.5	101.7	103.8	105.6	Renewables (GW)	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1
Total (GW)	782.3	836.5	899.8	938.5	979.7	Total (GW)	0.0	0.0	-1.4	-10.3	-16.6	-16.6	-16.6

**Table 11.9S Standard Level 4 Low Economic Growth Forecast based on Reverse Engineering Manufacturing Costs,
NAECA Efficiency Scenario**

NEMS-BRS Results:						Difference from AEO2000 Lmac Reference								
											Extrapolation			
Residential Sector Energy Consumption						Residential Sector Energy Consumption								
Electricity Sales (TWh)	2000	2005	2010	2015	2020	Electricity Sales (TWh)	2000	2005	2010	2015	2020	2025	2030	
	1,183	1,275	1,356	1,414	1,469		0.0	0.0	-10.4	-23.8	-35.8	-44.6	-50.6	
Total U.S. Electric Generation						Total U.S. Electric Generation								
Coal (TWh)	1,923	2,105	2,131	2,170	2,208	Coal (TWh)	0.0	0.0	-2.9	-2.1	-7.6	-7.6	-7.6	
Gas (TWh)	591	683	933	1,178	1,311	Gas (TWh)	0.0	0.0	-7.4	-21.9	-26.2	-26.2	-26.2	
Petroleum(TWh)	85	60	42	39	35	Petroleum(TWh)	0.0	0.0	-0.8	0.5	0.8	0.8	0.8	
Nuclear (TWh)	688	674	627	511	428	Nuclear (TWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Renewables (TWh)	388	409	425	433	441	Renewables (TWh)	0.0	0.0	0.1	0.1	-0.4	-0.4	-0.4	
Total (TWh)	3,675	3,931	4,158	4,331	4,423	Total (TWh)	0.0	0.0	-11.0	-23.4	-33.2	-33.2	-33.2	
Installed Generating Capacity						Installed Generating Capacity								
Coal (GW)	315.3	309.6	308.0	309.4	310.8	Coal (GW)	0.0	0.0	0.0	-0.1	-0.6	-0.6	-0.6	
Other Fossil (GW)	275.0	325.3	387.7	426.1	458.7	Other Fossil (GW)	0.0	0.0	-1.3	-8.8	-13.9	-13.9	-13.9	
Nuclear (GW)	97.5	93.4	84.1	67.4	57.0	Nuclear (GW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Renewables (GW)	94.7	98.3	101.2	103.0	104.4	Renewables (GW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total (GW)	782.5	826.6	881.0	905.8	930.9	Total (GW)	0.0	0.0	-1.3	-9.0	-14.5	-14.5	-14.5	

**Table 11.10S Standard Level 4 High Economic Growth Forecast based on Reverse Engineering Manufacturing Costs,
NAECA Efficiency Scenario**

NEMS-BRS Results:						Difference from AEO2000 Hmac Reference							
						Extrapolation							
Residential Sector Energy Consumption						Residential Sector Energy Consumption							
Electricity Sales (TWh)	2000	2005	2010	2015	2020	Electricity Sales (TWh)	2000	2005	2010	2015	2020	2025	2030
	1,183	1,286	1,379	1,460	1,544		0.0	0.0	-11.6	-26.2	-38.6	-47.0	-52.6
Total U.S. Electric Generation						Total U.S. Electric Generation							
Coal (TWh)	1,937	2,159	2,230	2,368	2,601	Coal (TWh)	0.0	0.0	-1.4	-11.3	-28.1	-28.1	-28.1
Gas (TWh)	615	762	1,063	1,357	1,468	Gas (TWh)	0.0	-0.4	-9.2	-16.2	-9.9	-9.9	-9.9
Petroleum(TWh)	95	83	74	65	70	Petroleum(TWh)	0.0	0.0	-1.6	0.4	1.8	1.8	1.8
Nuclear (TWh)	688	674	627	510	440	Nuclear (TWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (TWh)	389	414	435	446	459	Renewables (TWh)	0.0	0.0	-0.1	0.0	-0.3	-0.3	-0.3
Total (TWh)	3,724	4,092	4,429	4,746	5,037	Total (TWh)	0.0	-0.4	-12.3	-27.1	-36.5	-36.5	-36.5
Installed Generating Capacity						Installed Generating Capacity							
Coal (GW)	315.3	311.2	315.4	329.8	358.5	Coal (GW)	0.0	0.0	0.0	-1.1	-3.5	-3.5	-3.5
Other Fossil (GW)	274.8	340.1	426.3	481.9	516.7	Other Fossil (GW)	0.0	0.0	-1.6	-9.8	-12.5	-12.5	-12.5
Nuclear (GW)	97.5	93.4	84.1	67.4	58.7	Nuclear (GW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (GW)	94.9	99.1	102.7	105.1	107.5	Renewables (GW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (GW)	782.5	843.8	928.5	984.3	1,041.4	Total (GW)	0.0	0.0	-1.6	-10.8	-16.0	-16.0	-16.0

Table 11.7A Standard Level 4 Roll-up Forecast based on ARI Mean Manufacturing Costs

NEMS-BRS Results:						Difference from AEO2000 Reference							
						Extrapolation							
Residential Sector Energy Consumption						Residential Sector Energy Consumption							
Electricity Sales (TWh)	2000	2005	2010	2015	2020	Electricity Sales (TWh)	2000	2005	2010	2015	2020	2025	2030
	1,185	1,281	1,369	1,440	1,518		0.0	0.0	-10.4	-23.8	-35.4	-43.3	-48.4
Total U.S. Electric Generation						Total U.S. Electric Generation							
Coal (TWh)	1,930	2,127	2,172	2,246	2,333	Coal (TWh)	0.0	0.0	-0.3	-5.5	-14.2	-14.2	-14.2
Gas (TWh)	601	717	992	1,278	1,455	Gas (TWh)	0.0	0.0	-8.7	-19.1	-21.2	-21.2	-21.2
Petroleum (TWh)	90	68	53	47	46	Petroleum (TWh)	0.0	0.0	-0.7	0.3	1.6	1.6	1.6
Nuclear (TWh)	688	674	627	511	427	Nuclear (TWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (TWh)	389	411	429	437	447	Renewables (TWh)	0.0	0.0	-0.3	0.3	0.0	0.0	0.0
Total (TWh)	3,698	3,997	4,273	4,519	4,707	Total (TWh)	0.0	0.0	-10.0	-24.0	-33.8	-33.8	-33.8
Installed Generating Capacity						Installed Generating Capacity							
Coal (GW)	315.3	310.6	310.7	315.3	324.2	Coal (GW)	0.0	0.0	0.0	-0.5	-1.8	-1.8	-1.8
Other Fossil (GW)	274.8	334.0	403.4	453.0	494.5	Other Fossil (GW)	0.0	0.0	-1.3	-8.8	-13.1	-13.1	-13.1
Nuclear (GW)	97.5	93.4	84.1	67.4	57.0	Nuclear (GW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (GW)	94.7	98.5	101.7	103.8	105.7	Renewables (GW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (GW)	782.3	836.5	899.9	939.5	981.3	Total (GW)	0.0	0.0	-1.3	-9.3	-15.0	-15.0	-15.0

Table 11.8A Standard Level 4 Shift Forecast based on ARI Mean Manufacturing Costs

NEMS-BRS Results:						Difference from AEO2000 Reference						
												Extrapolation
Residential Sector Energy Consumption						Residential Sector Energy Consumption						
Electricity Sales (TWh)	2000	2005	2010	2015	2020	2000	2005	2010	2015	2020	2025	2030
	1,185	1,281	1,368	1,438	1,513	0.0	0.0	-11.4	-26.5	-39.6	-48.6	-54.5
Total U.S. Electric Generation						Total U.S. Electric Generation						
Coal (TWh)	1,930	2,127	2,171	2,244	2,331	0.0	0.0	-0.7	-6.5	-16.0	-16.0	-16.0
Gas (TWh)	601	717	992	1,276	1,452	0.0	0.0	-9.5	-21.1	-23.7	-23.7	-23.7
Petroleum (TWh)	90	68	53	47	46	0.0	0.0	-1.1	0.2	2.1	2.1	2.1
Nuclear (TWh)	688	674	627	511	427	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (TWh)	389	411	429	437	447	0.0	0.0	-0.2	0.4	0.0	0.0	0.0
Total (TWh)	3,698	3,997	4,272	4,516	4,703	0.0	0.0	-11.5	-27.0	-37.5	-37.5	-37.5
Installed Generating Capacity						Installed Generating Capacity						
Coal (GW)	315.3	310.6	310.7	315.2	323.9	0.0	0.0	0.0	-0.6	-2.1	-2.1	-2.1
Other Fossil (GW)	274.8	334.0	403.3	452.2	493.3	0.0	0.0	-1.4	-9.6	-14.3	-14.3	-14.3
Nuclear (GW)	97.5	93.4	84.1	67.4	57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (GW)	94.7	98.5	101.7	103.8	105.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (GW)	782.3	836.5	899.8	938.7	979.9	0.0	0.0	-1.4	-10.1	-16.4	-16.4	-16.4

**Table 11.9A Standard Level 4 Low Economic Growth Forecast based on ARI Mean Manufacturing Costs,
NAECA Efficiency Scenario**

NEMS-BRS Results:						Difference from AEO2000 Lmac Reference						
												Extrapolation
<i>Residential Sector Energy Consumption</i>						<i>Residential Sector Energy Consumption</i>						
Electricity Sales (TWh)	2000	2005	2010	2015	2020	2000	2005	2010	2015	2020	2025	2030
	1,183	1,275	1,356	1,415	1,470	0.0	0.0	-10.1	-23.4	-35.4	-44.3	-50.4
<i>Total U.S. Electric Generation</i>						<i>Total U.S. Electric Generation</i>						
Coal (TWh)	1,923	2,105	2,132	2,170	2,209	0.0	0.0	-1.8	-2.4	-7.1	-7.1	-7.1
Gas (TWh)	591	683	932	1,179	1,312	0.0	0.0	-7.9	-20.6	-25.4	-25.4	-25.4
Petroleum(TWh)	85	60	42	39	35	0.0	0.0	-0.6	0.5	0.5	0.5	0.5
Nuclear (TWh)	688	674	627	511	428	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (TWh)	388	409	425	433	441	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1
Total (TWh)	3,675	3,931	4,159	4,332	4,424	0.0	0.0	-10.3	-22.5	-32.2	-32.2	-32.2
<i>Installed Generating Capacity</i>						<i>Installed Generating Capacity</i>						
Coal (GW)	315.3	309.6	308.0	309.4	310.8	0.0	0.0	0.0	-0.1	-0.6	-0.6	-0.6
Other Fossil (GW)	275.0	325.3	387.7	426.4	459.2	0.0	0.0	-1.3	-8.5	-13.4	-13.4	-13.4
Nuclear (GW)	97.5	93.4	84.1	67.4	57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (GW)	94.7	98.3	101.2	103.0	104.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (GW)	782.5	826.6	881.0	906.2	931.5	0.0	0.0	-1.3	-8.6	-13.9	-13.9	-13.9

**Table 11.10A Standard Level 4 High Economic Growth Forecast based on ARI Mean Manufacturing Costs,
NAECA Efficiency Scenario**

NEMS-BRS Results:						Difference from AEO2000 Hmac Reference						
												Extrapolation
<i>Residential Sector Energy Consumption</i>						<i>Residential Sector Energy Consumption</i>						
Electricity Sales (TWh)	2000	2005	2010	2015	2020	2000	2005	2010	2015	2020	2025	2030
	1,183	1,286	1,380	1,460	1,545	0.0	0.0	-11.4	-25.8	-38.2	-46.6	-52.3
<i>Total U.S. Electric Generation</i>						<i>Total U.S. Electric Generation</i>						
Coal (TWh)	1,937	2,159	2,229	2,368	2,601	0.0	0.0	-2.1	-11.1	-27.8	-27.8	-27.8
Gas (TWh)	615	762	1,064	1,358	1,469	0.0	-0.4	-8.2	-15.1	-8.8	-8.8	-8.8
Petroleum(TWh)	95	83	74	65	70	0.0	0.0	-1.8	0.0	1.5	1.5	1.5
Nuclear (TWh)	688	674	627	510	440	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (TWh)	389	414	435	446	459	0.0	0.0	-0.1	0.0	-0.2	-0.2	-0.2
Total (TWh)	3,724	4,092	4,429	4,747	5,039	0.0	-0.4	-12.2	-26.2	-35.4	-35.4	-35.4
<i>Installed Generating Capacity</i>						<i>Installed Generating Capacity</i>						
Coal (GW)	315.3	311.2	315.4	329.9	358.6	0.0	0.0	0.0	-1.0	-3.4	-3.4	-3.4
Other Fossil (GW)	274.8	340.1	426.5	482.0	517.1	0.0	0.0	-1.4	-9.7	-12.1	-12.1	-12.1
Nuclear (GW)	97.5	93.4	84.1	67.4	58.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (GW)	94.9	99.1	102.7	105.1	107.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total (GW)	782.5	843.8	928.7	984.4	1,041.8	0.0	0.0	-1.4	-10.7	-15.6	-15.6	-15.6

J.6 SUPPLEMENTAL TABLES AND FIGURES TO CHAPTER 12

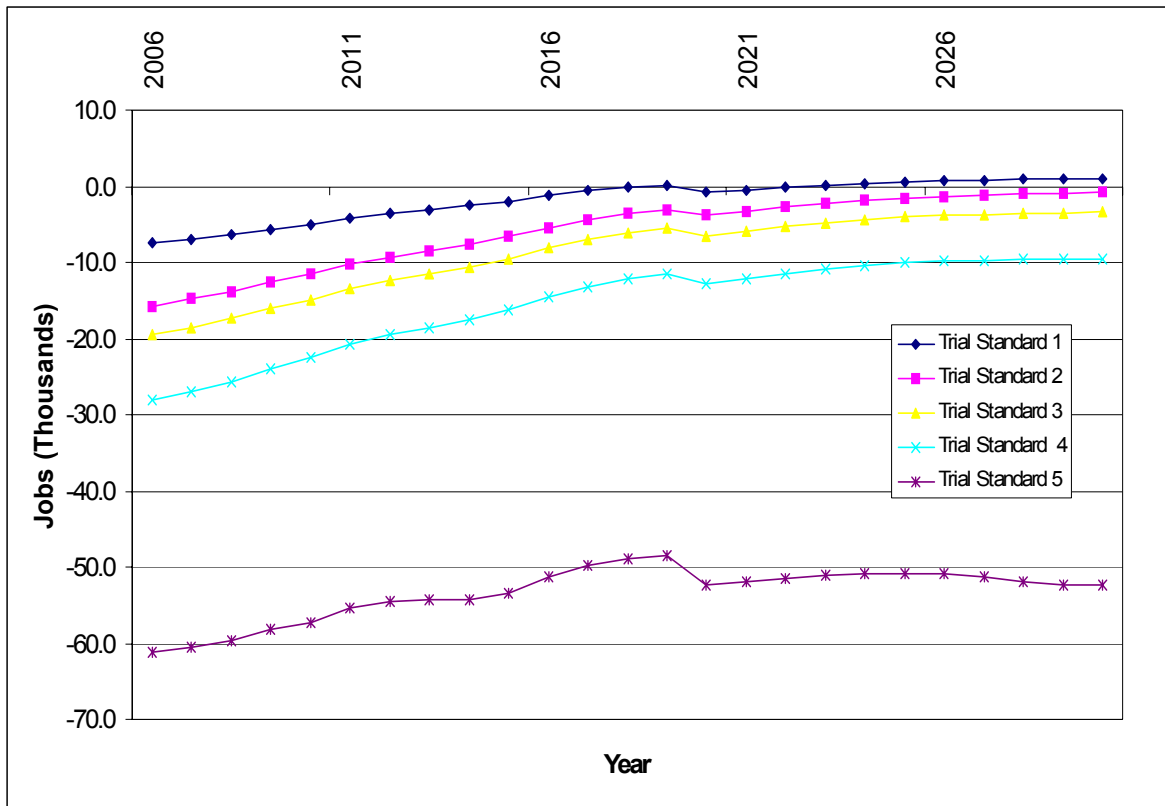


Figure 12.1S Net National Employment Impacts

Table 12.1S Net National Change in Jobs

Trial Standard Level	2010 (thousands)	2020 (thousands)	2030 (thousands)
1	-4.9	-0.8	1.0
2	-11.5	-3.8	-0.9
3	-14.9	-6.5	-3.4
4	-22.6	-12.8	-9.5
5	-57.3	-52.4	-52.5

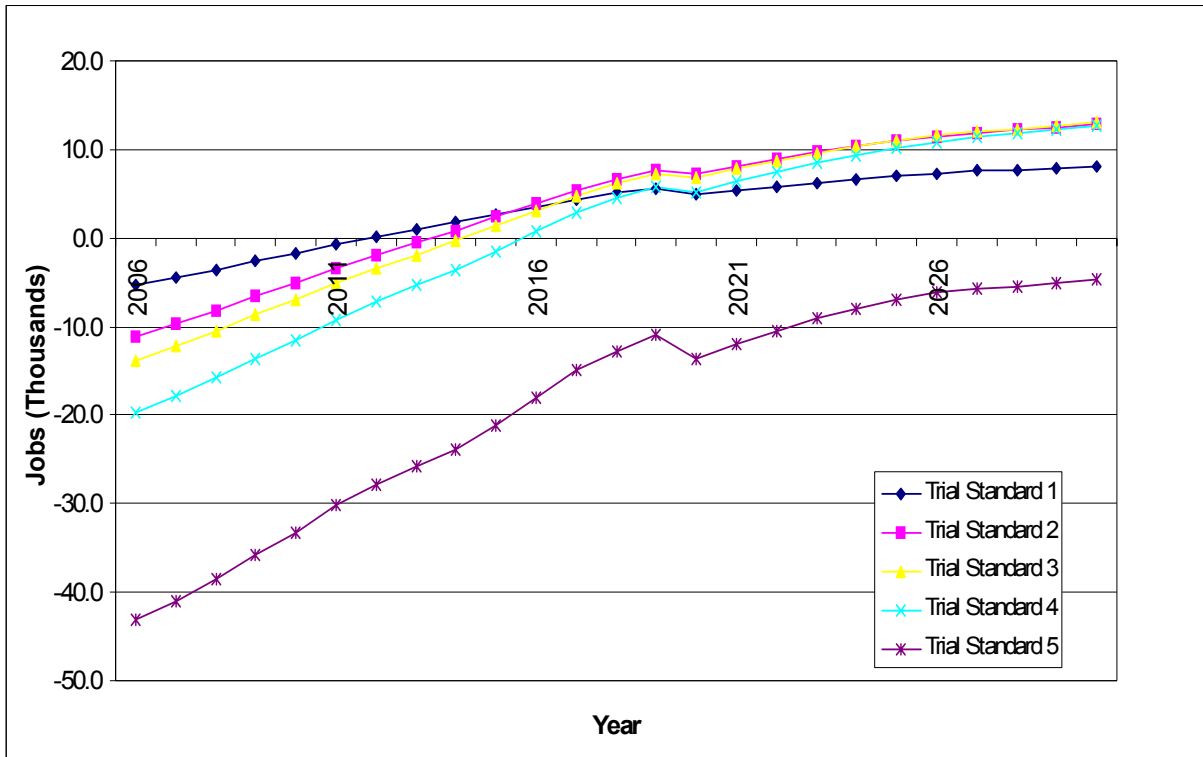


Figure 12.2S Employment Impacts of Consumer Savings

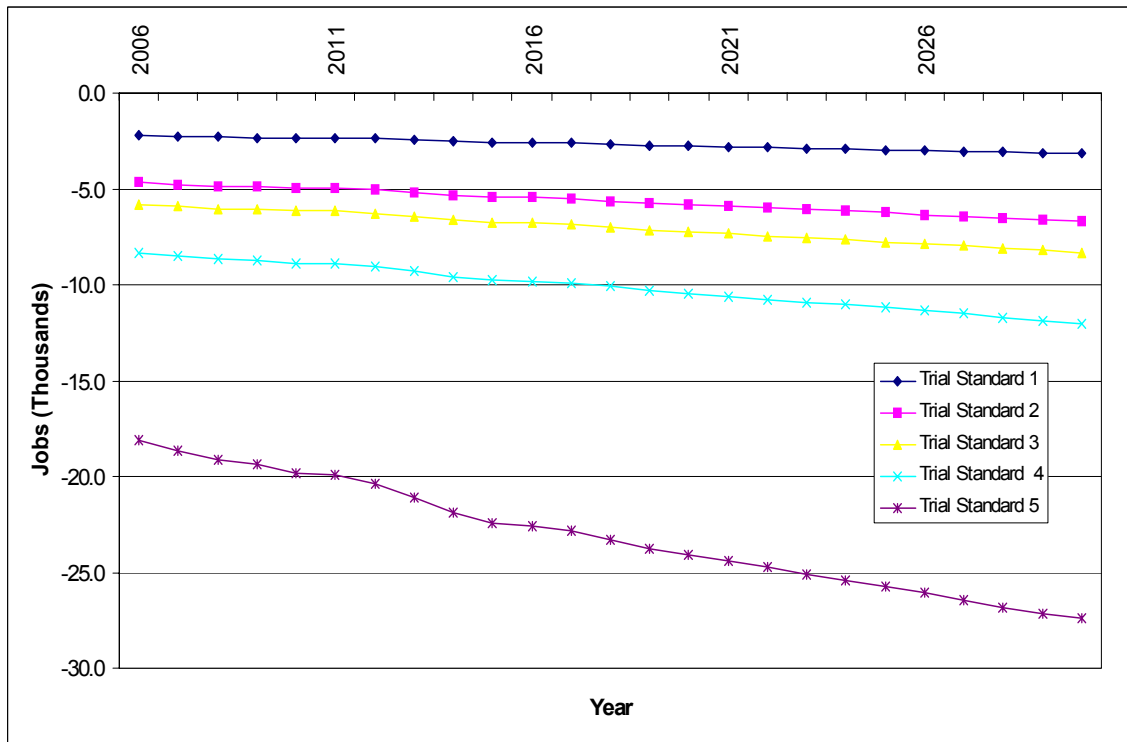


Figure 12.3S Economic Impacts of Changes in Equipment Cost

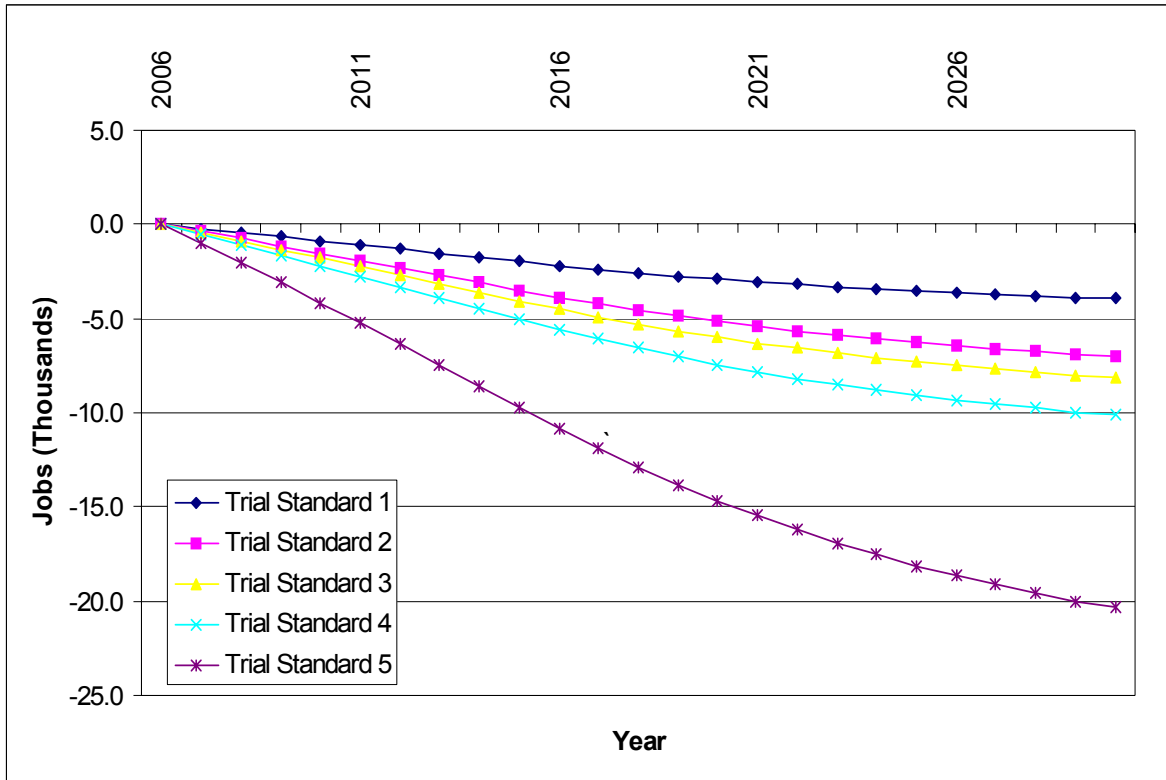


Figure 12.4S Economic Impacts of Changes in Utility Savings

J.7 SUPPLEMENTAL FIGURES TO APPENDIX E

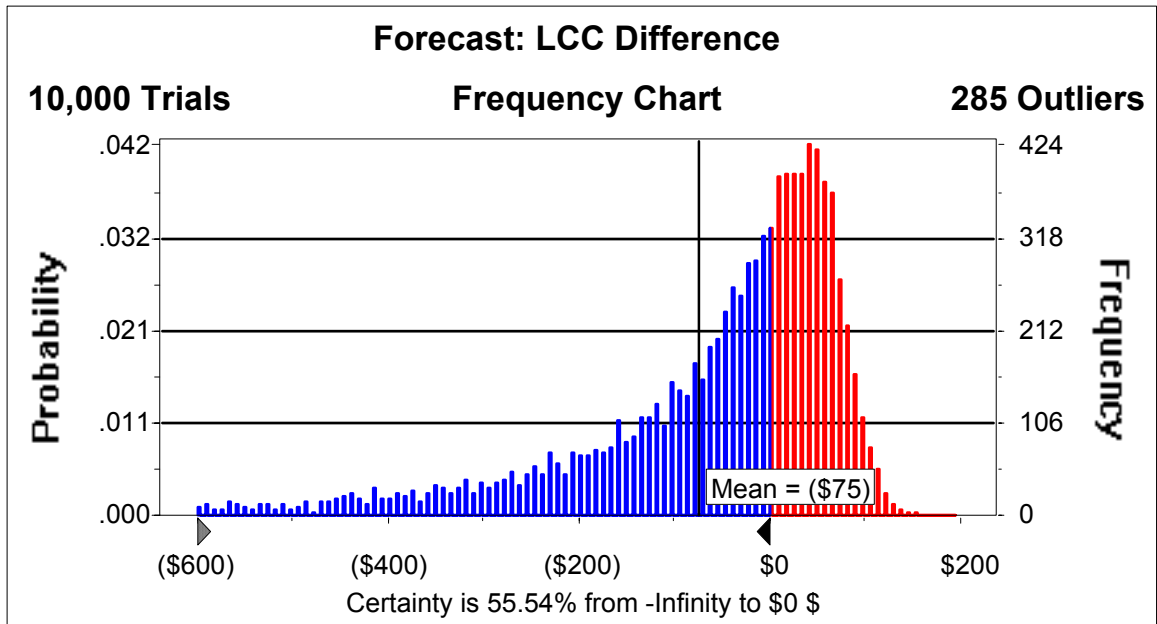


Figure E.1S Split A/C, 11 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

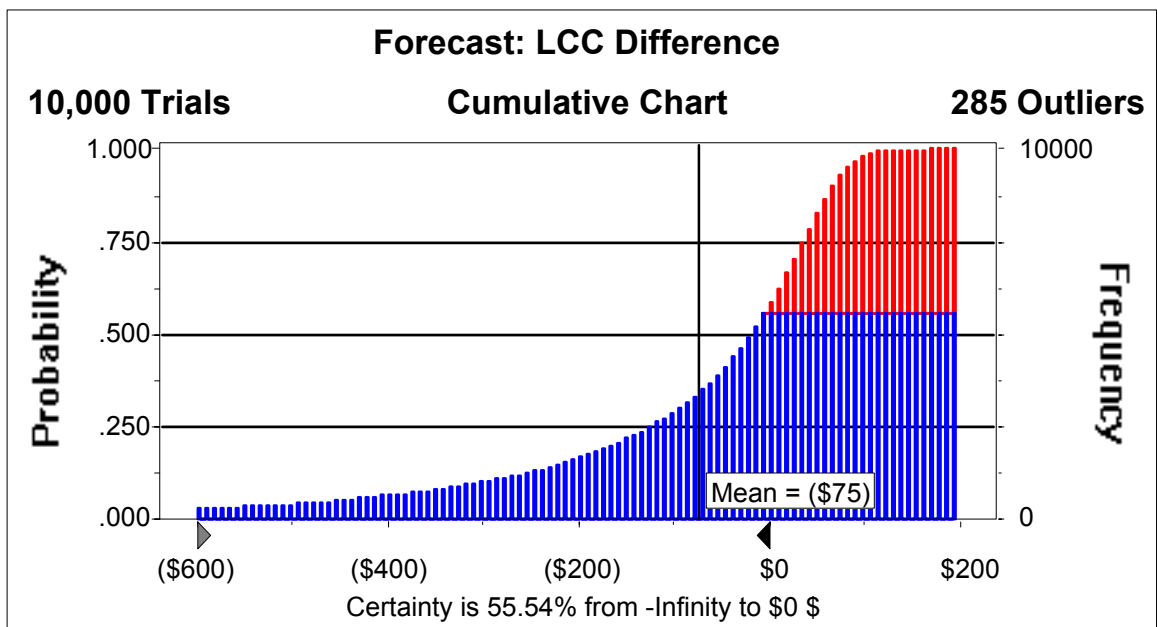


Figure E.2S Split A/C, 11 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

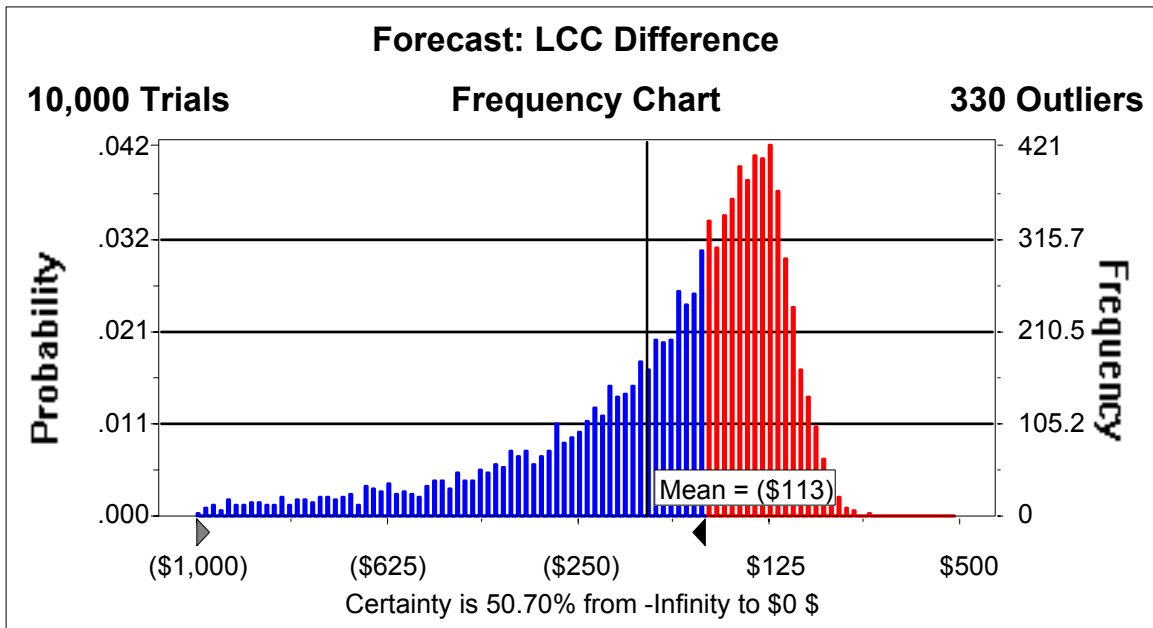


Figure E.3S Split A/C, 12 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

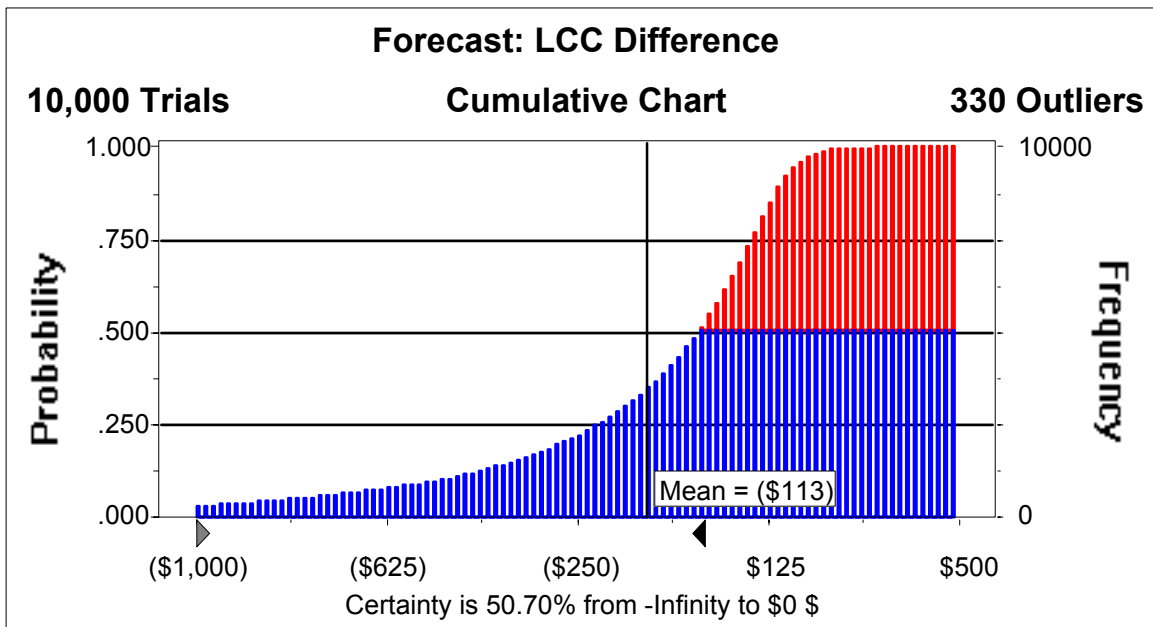


Figure E.4S Split A/C, 12 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

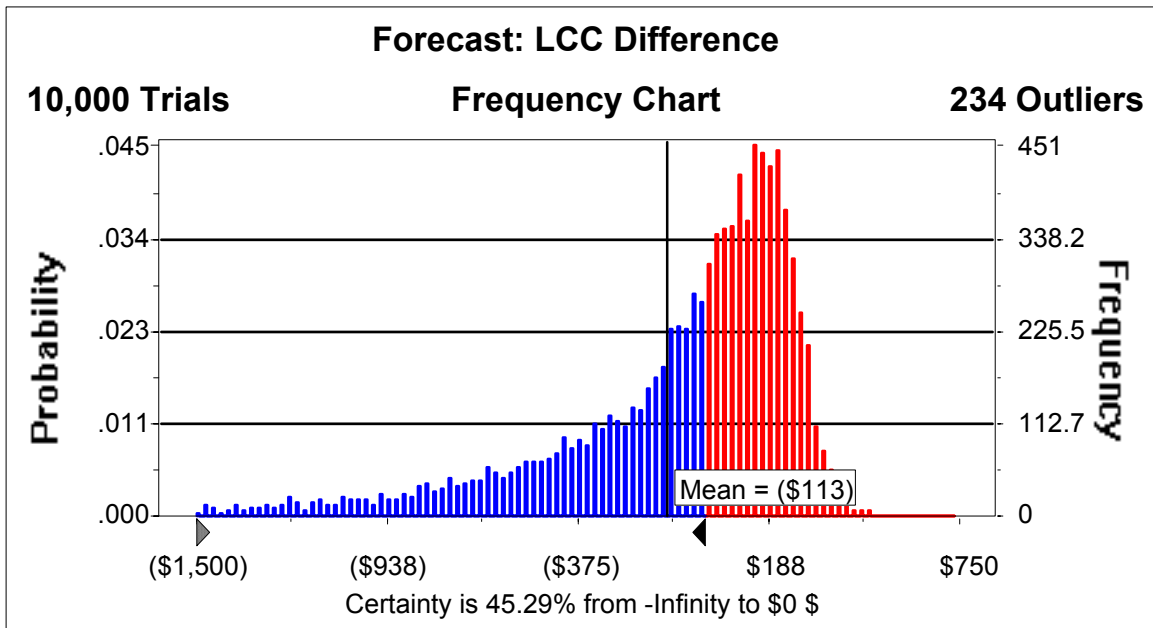


Figure E.5S Split A/C, 13 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

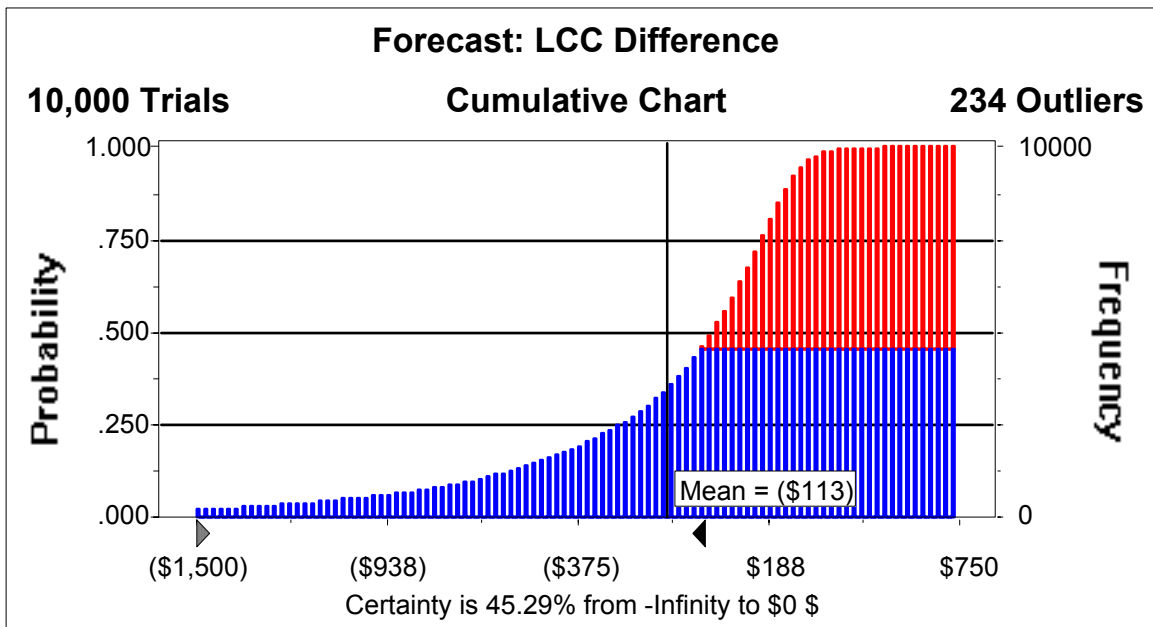


Figure E.6S Split A/C, 13 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

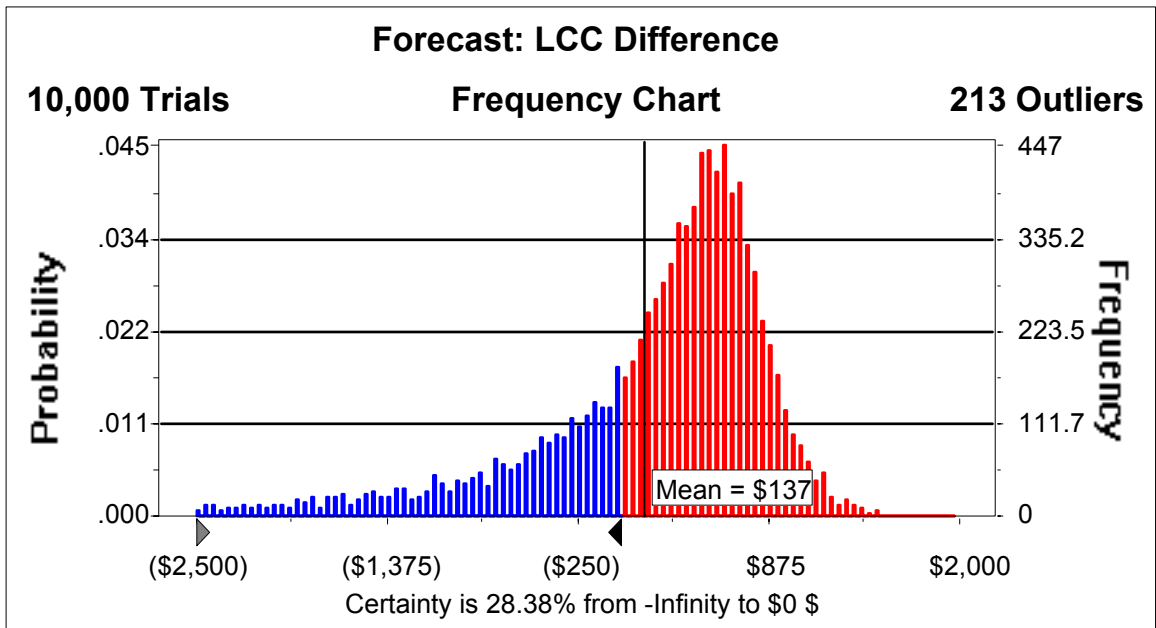


Figure E.7S Split A/C, 18 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

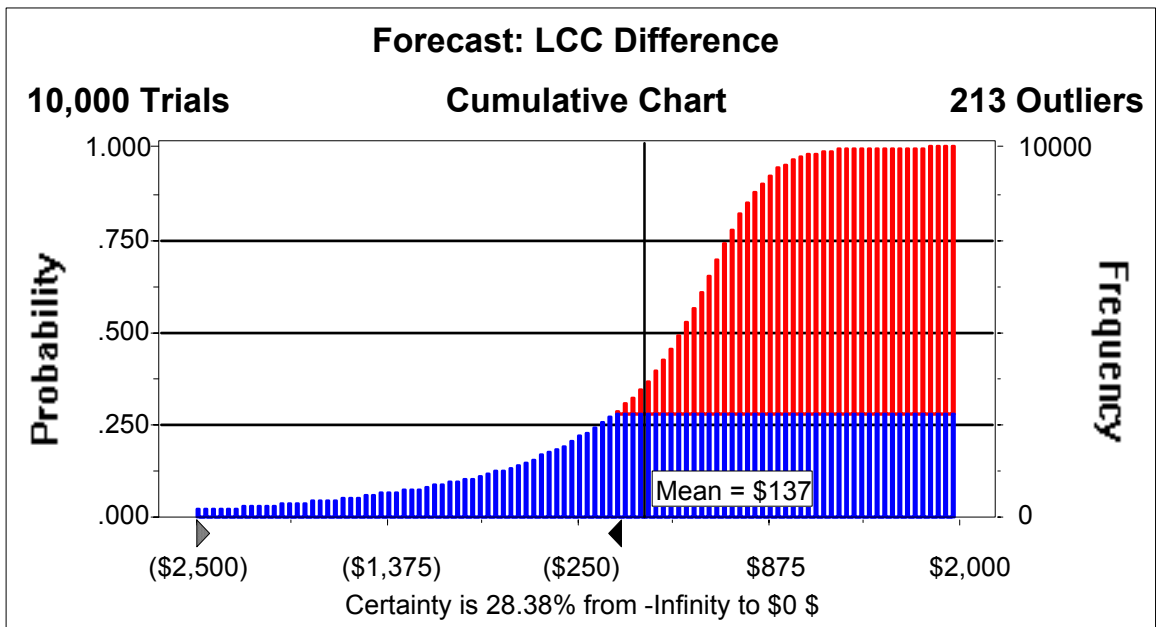


Figure E.8S Split A/C, 18 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

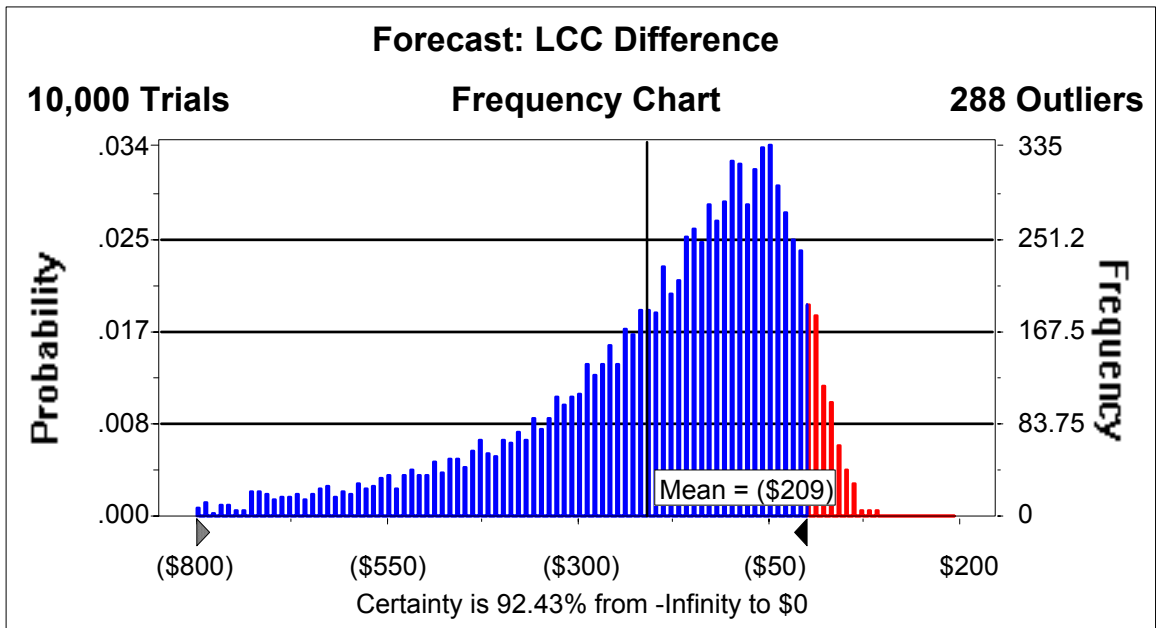


Figure E.9S Split HP, 11 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

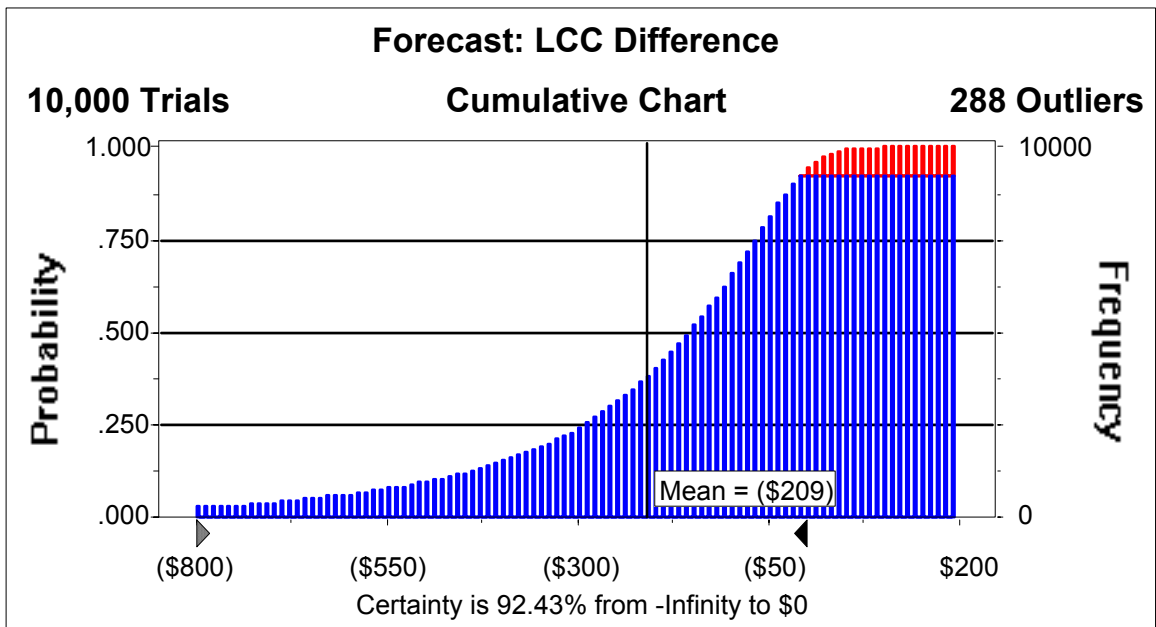


Figure E.10S Split HP, 11 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

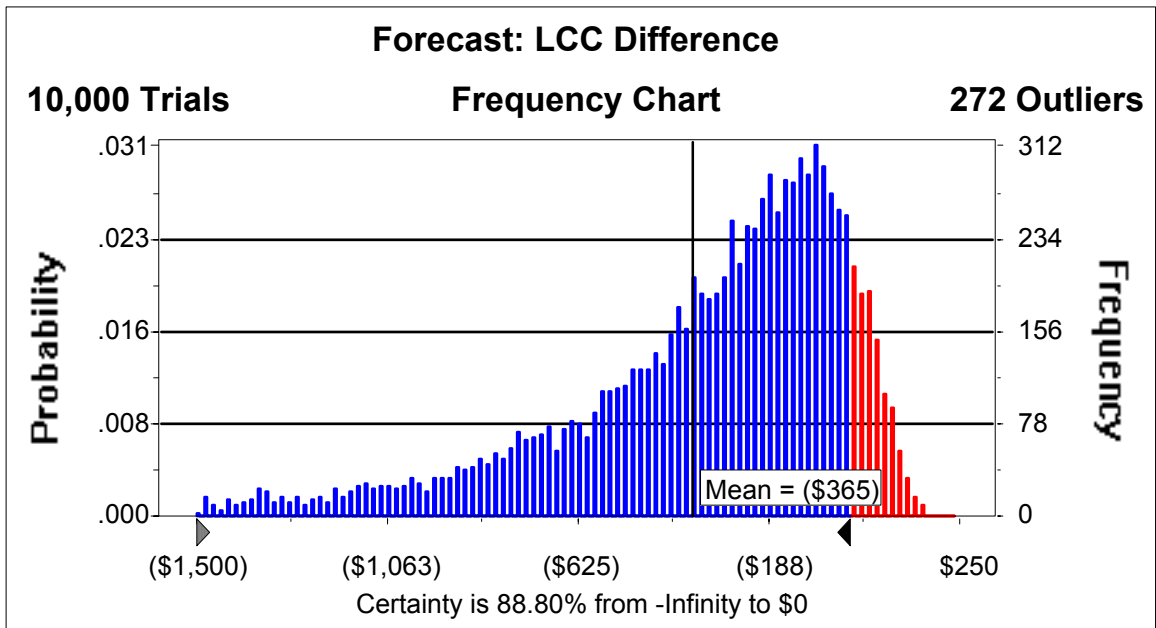


Figure E.11S Split HP, 12 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

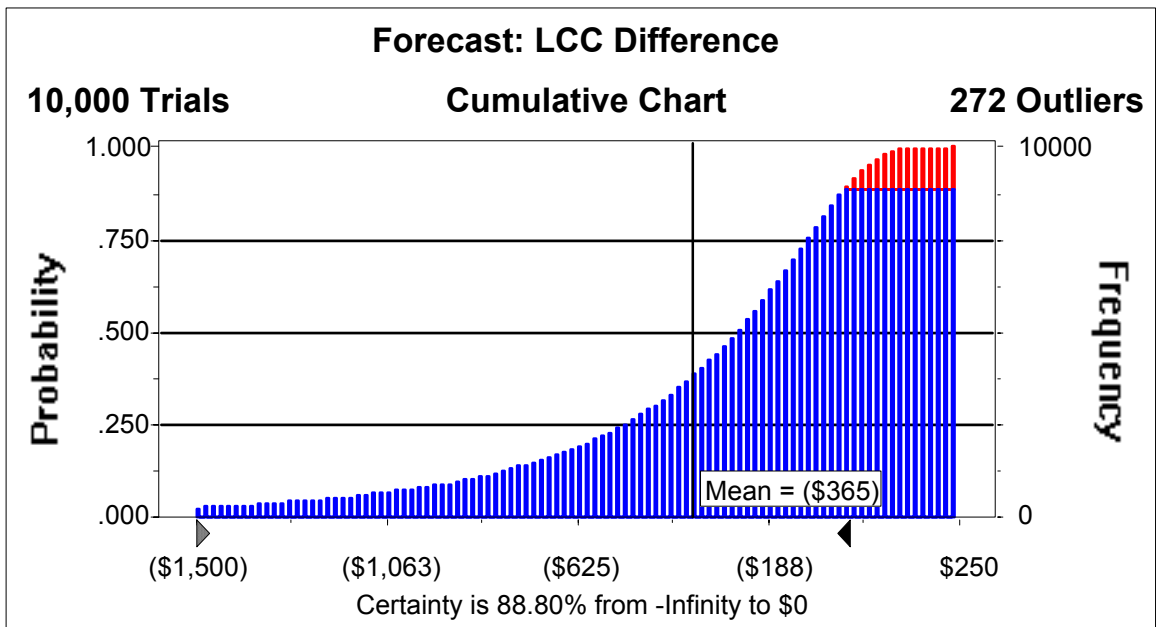


Figure E.12S Split HP, 12 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

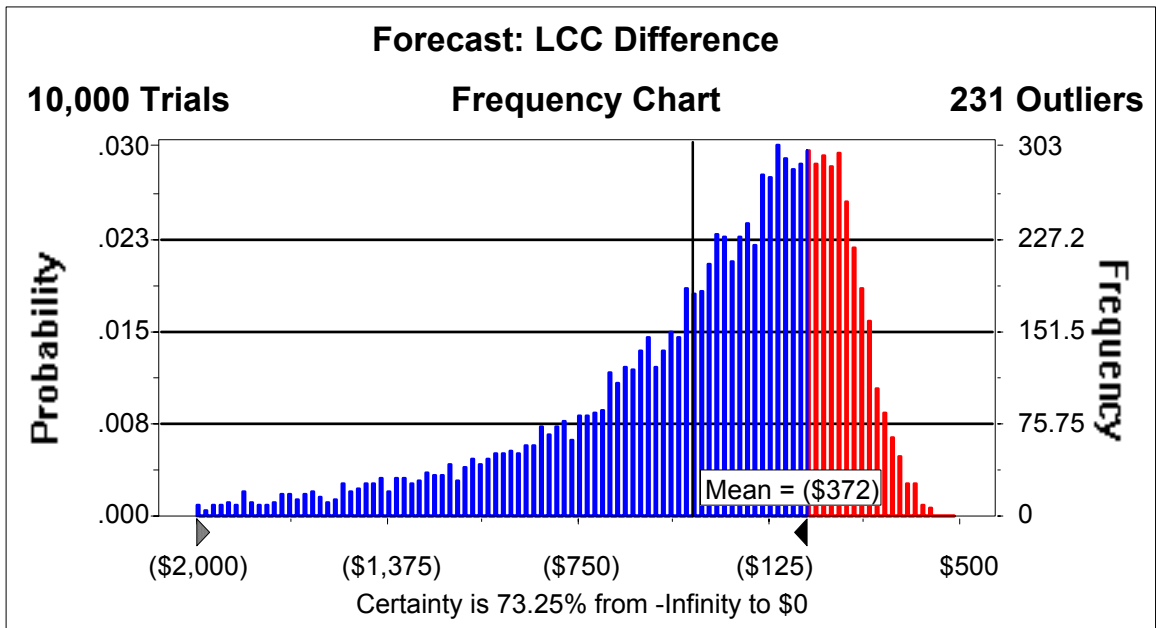


Figure E.13S Split HP, 13 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

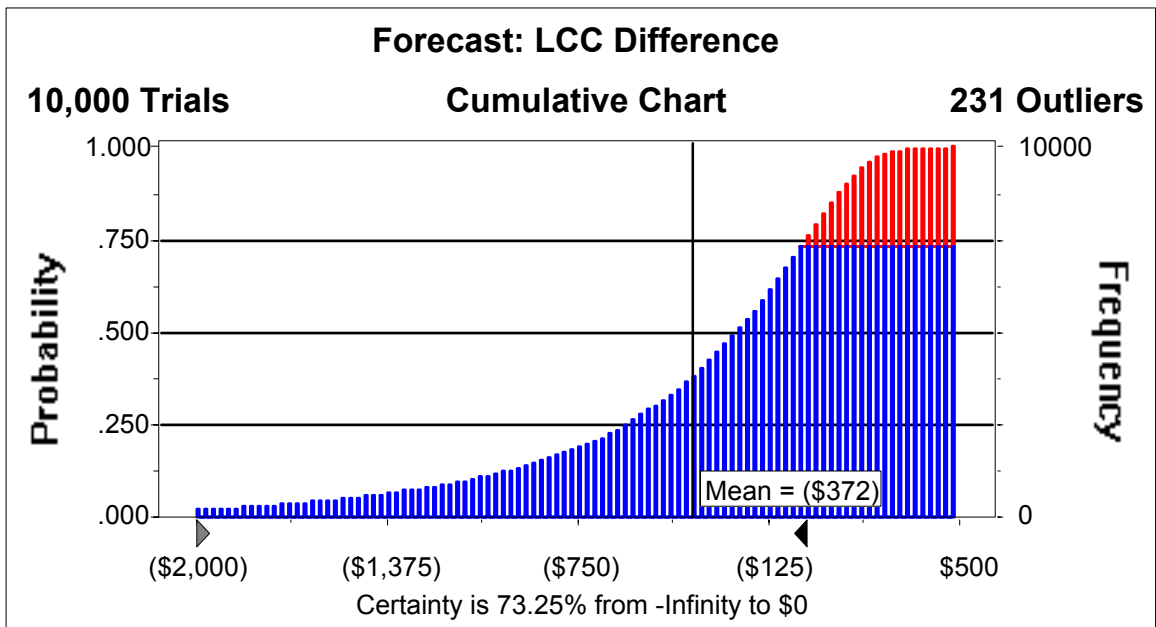


Figure E.14S Split HP, 13 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

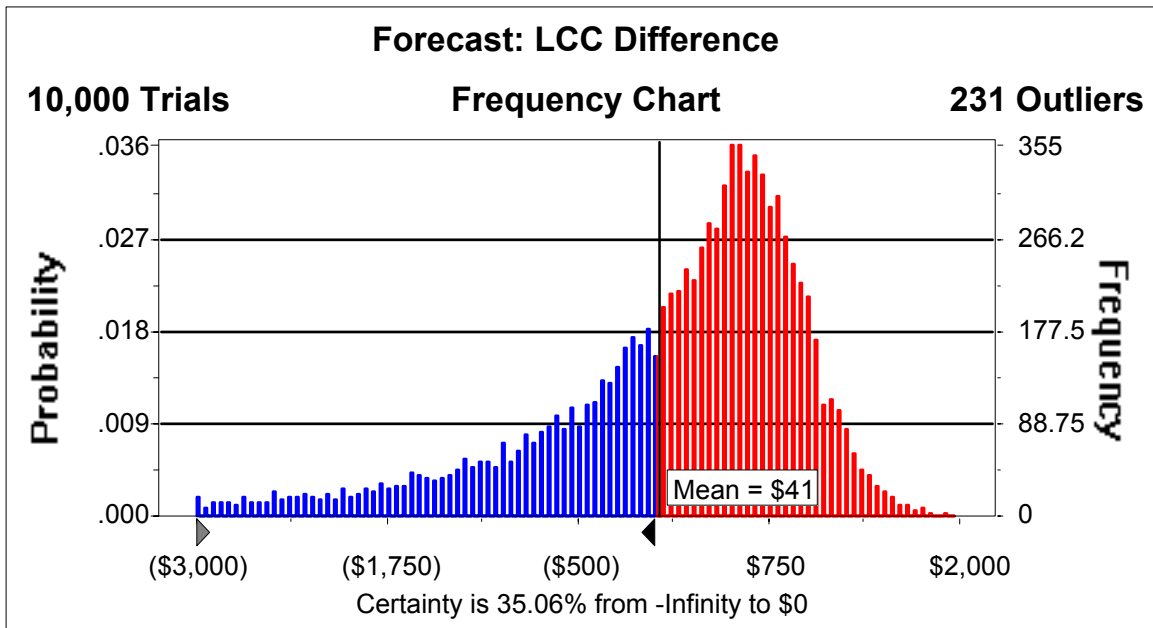


Figure E.15S Split HP, 18 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

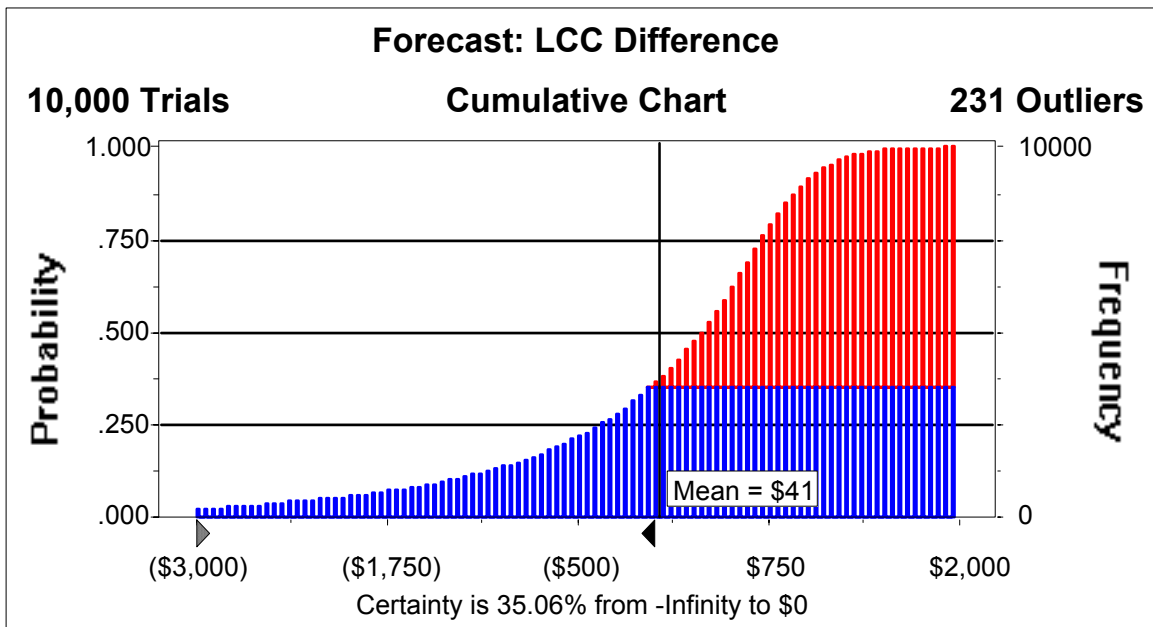


Figure E.16S Split HP, 18 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

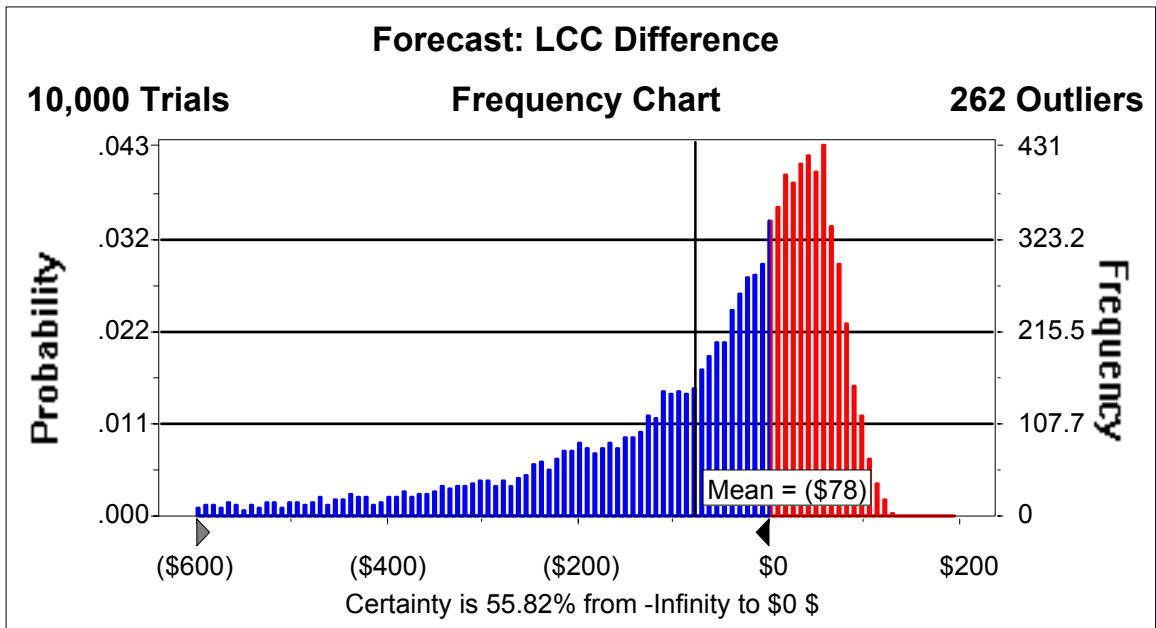


Figure E.17S Single Package A/C, 11 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

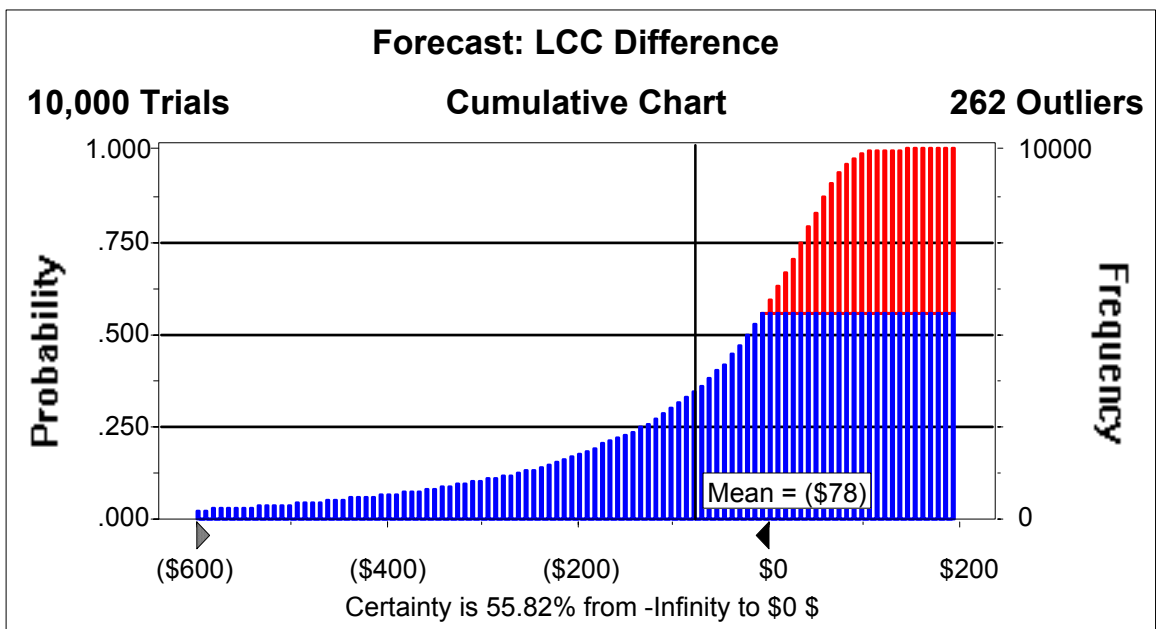


Figure E.18S Single Package A/C, 11 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

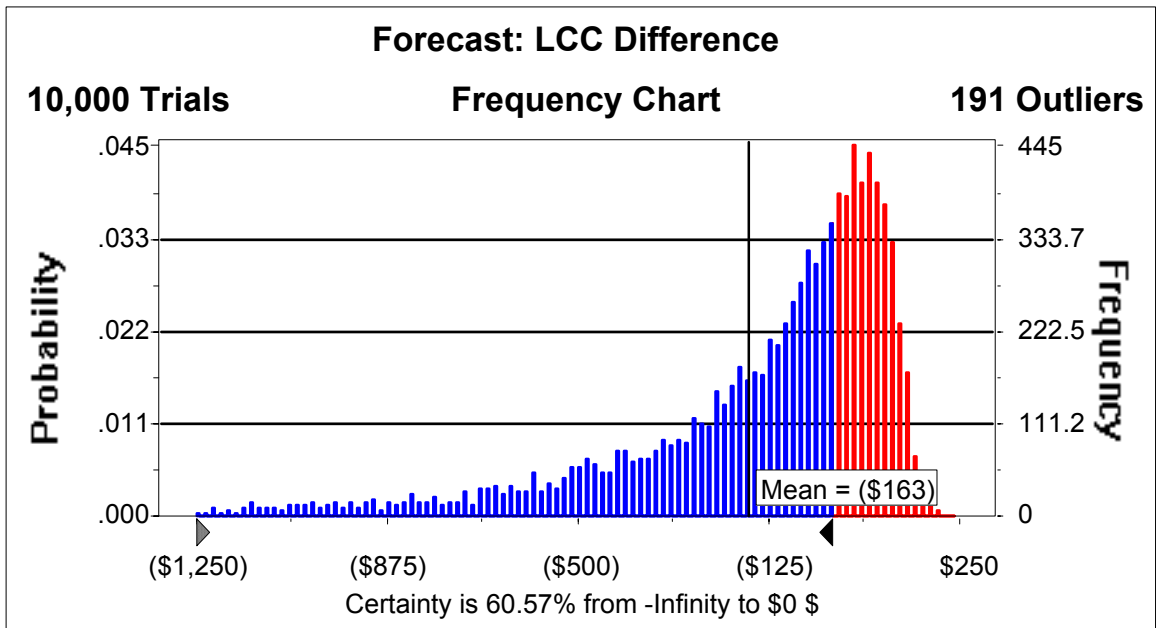


Figure E.19S Single Package A/C, 12 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

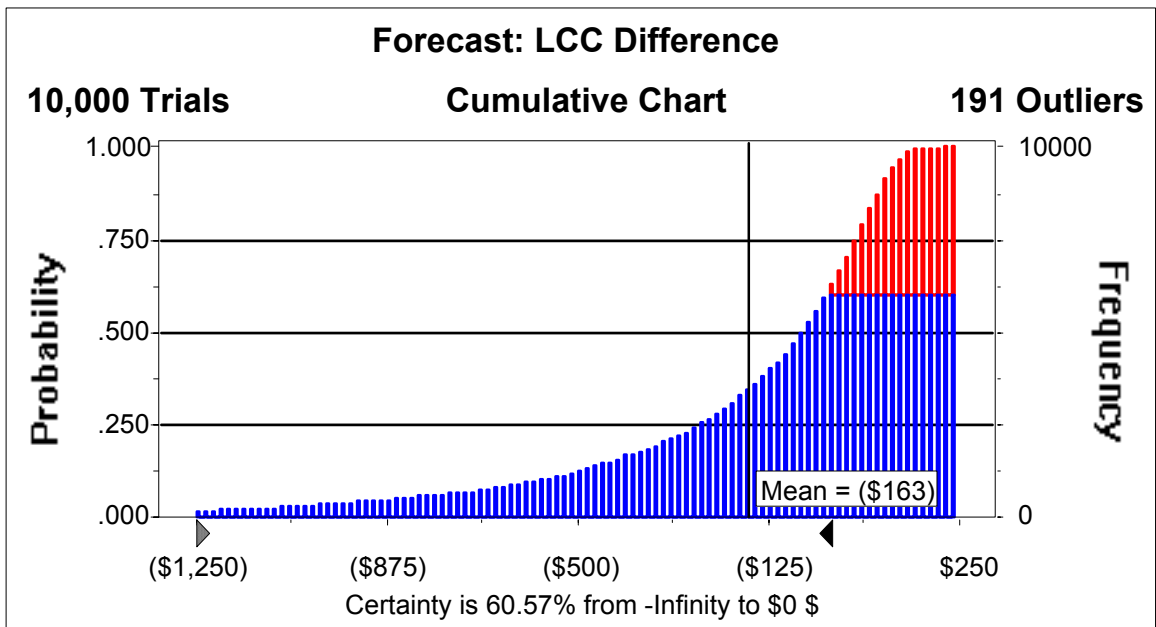


Figure E.20S Single Package A/C, 12 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

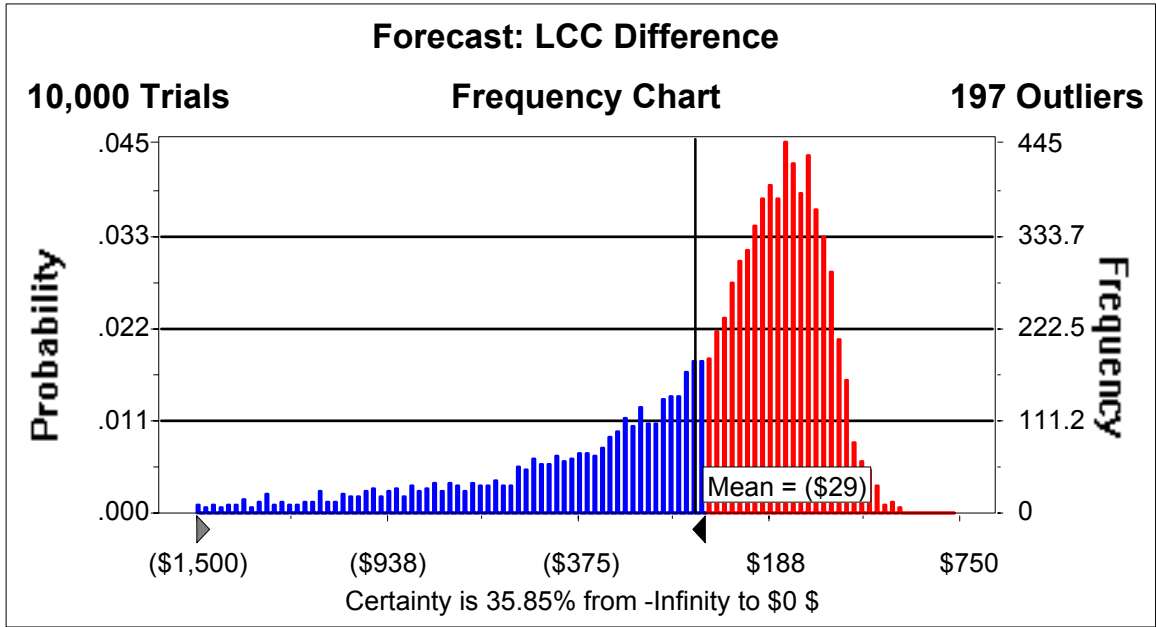


Figure E.21S Single Package A/C, 13 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

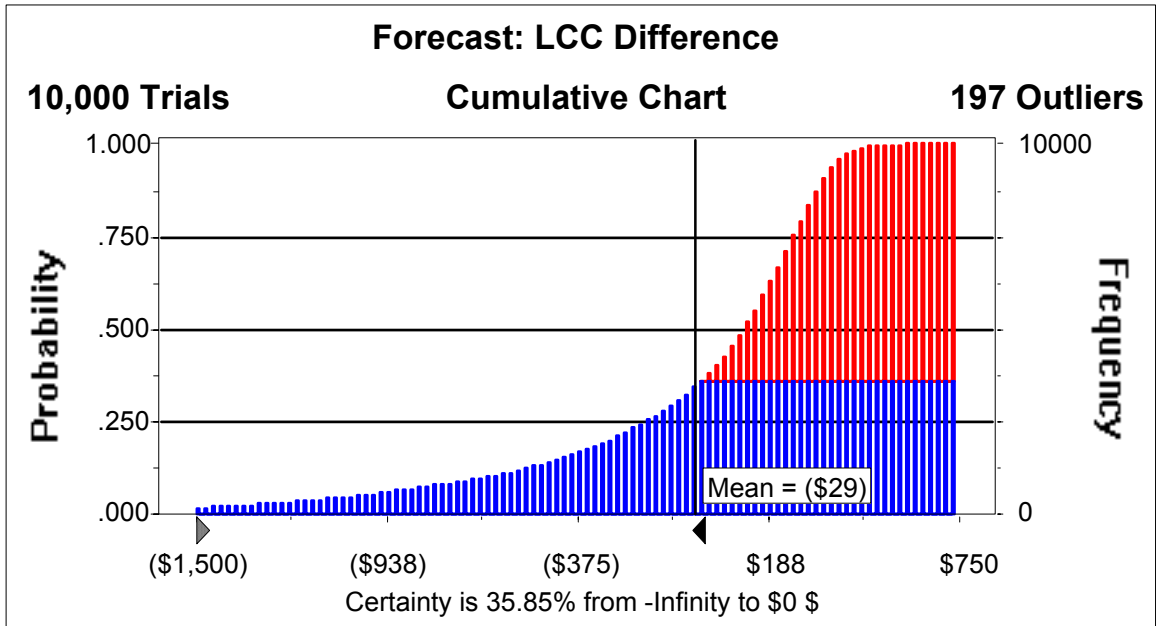


Figure E.22S Single Package A/C, 13 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

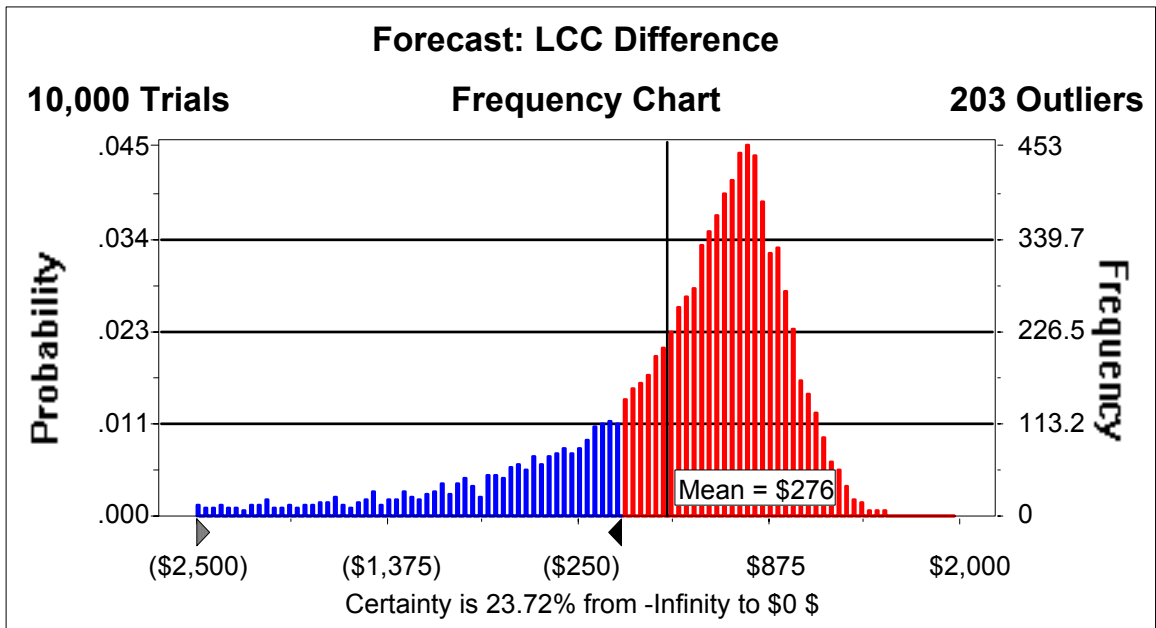


Figure E.23S Single Package A/C, 18 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

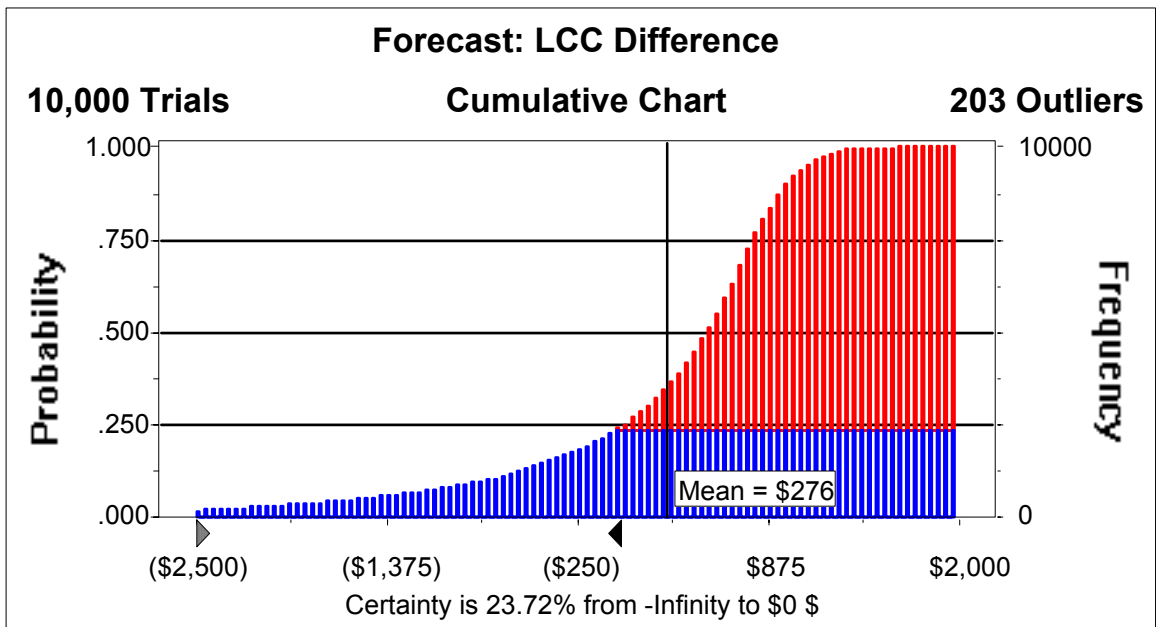


Figure E.24S Single Package A/C, 18 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

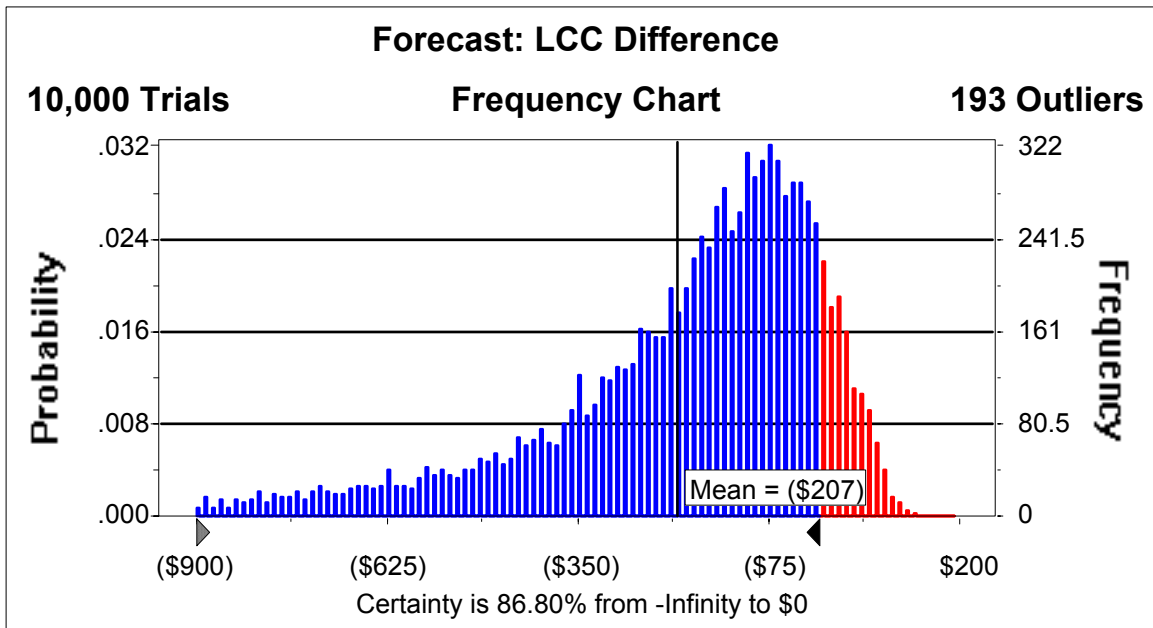


Figure E.25S Single Package HP, 11 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

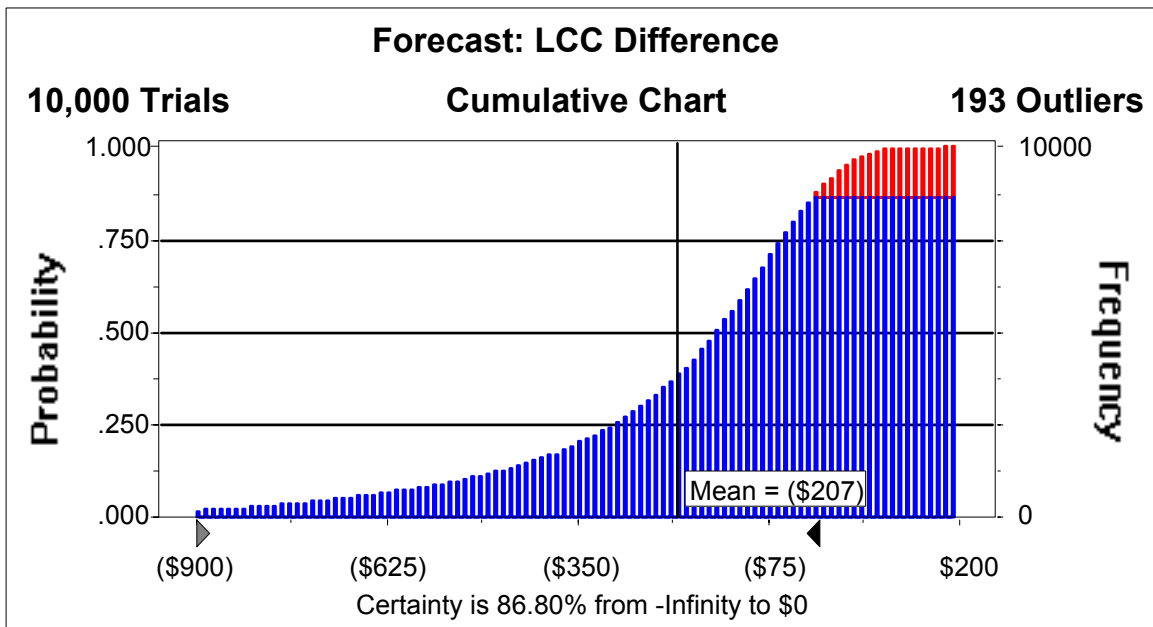


Figure E.26S Single Package HP, 11 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

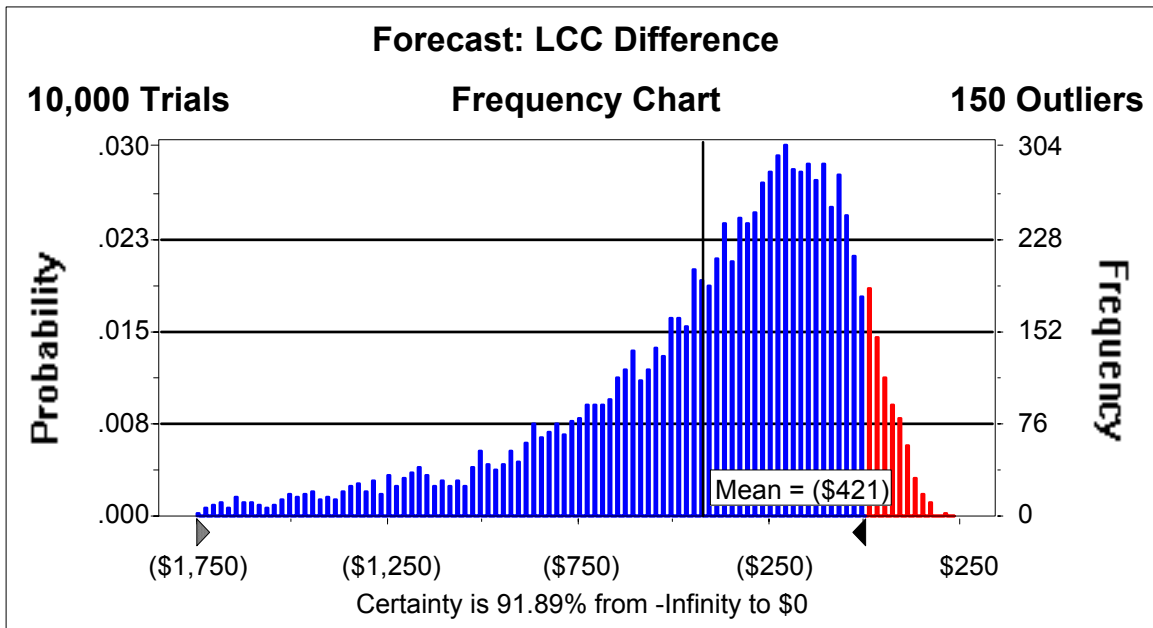


Figure E.27S Single Package HP, 12 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

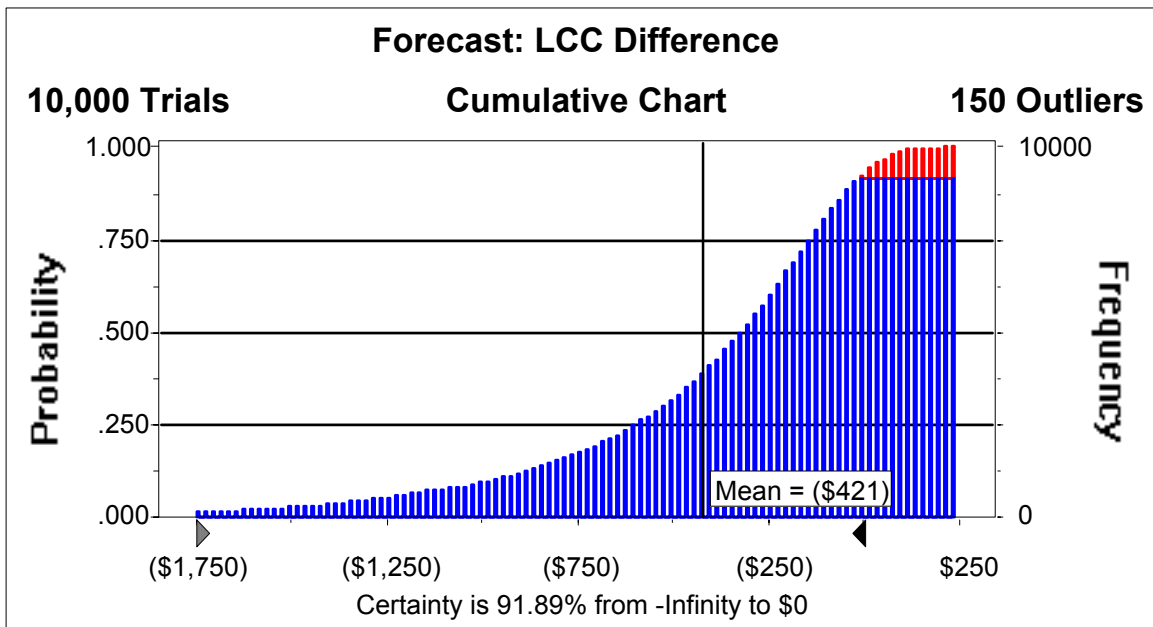


Figure E.28S Single Package HP, 12 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

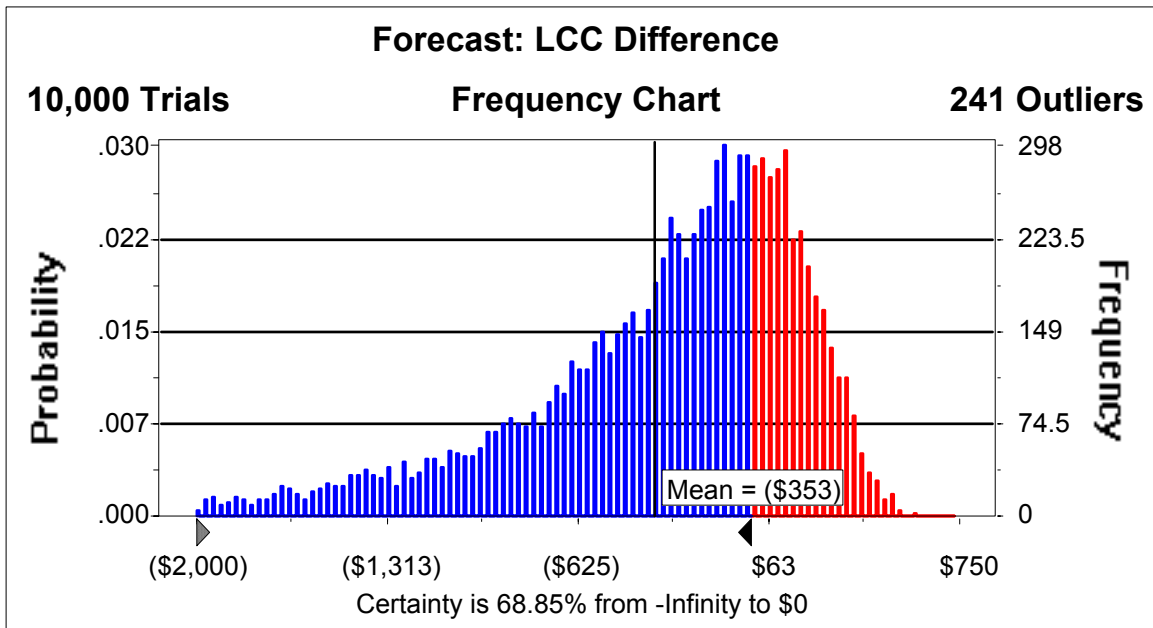


Figure E.29S Single Package HP, 13 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

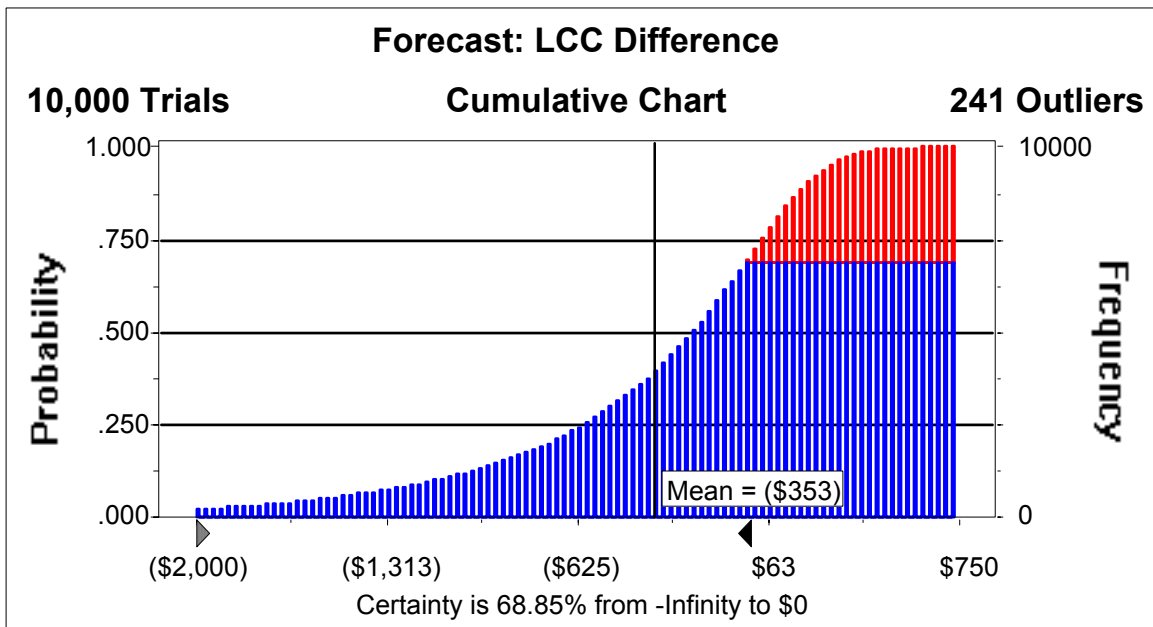


Figure E.30S Single Package HP, 13 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

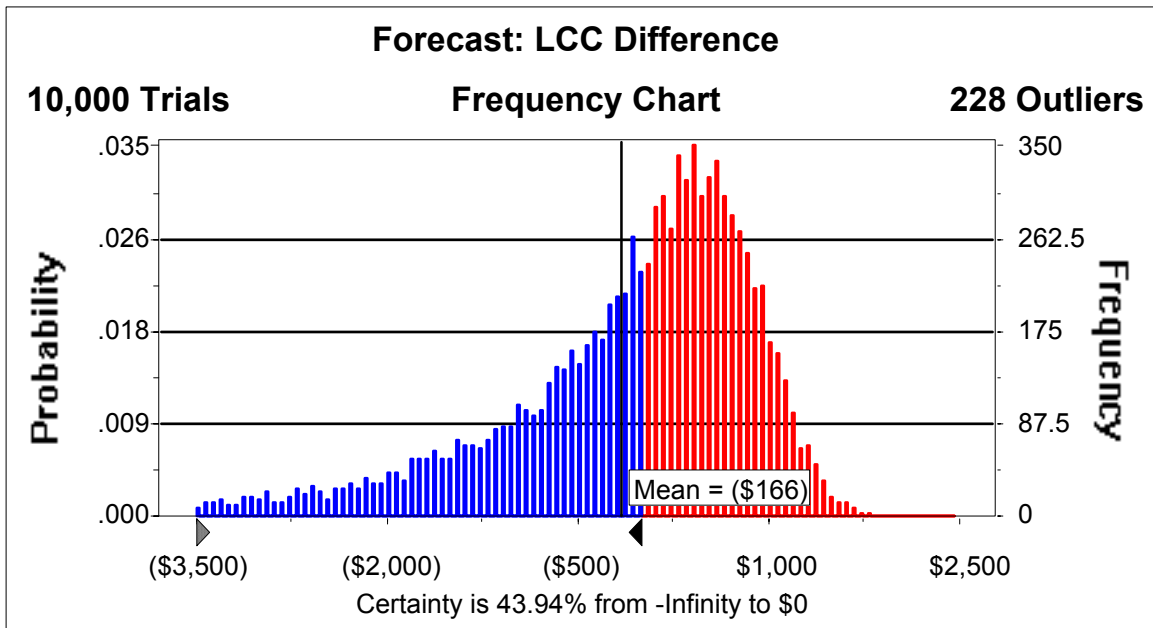


Figure E.31S Single Package HP, 18 SEER: Frequency Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

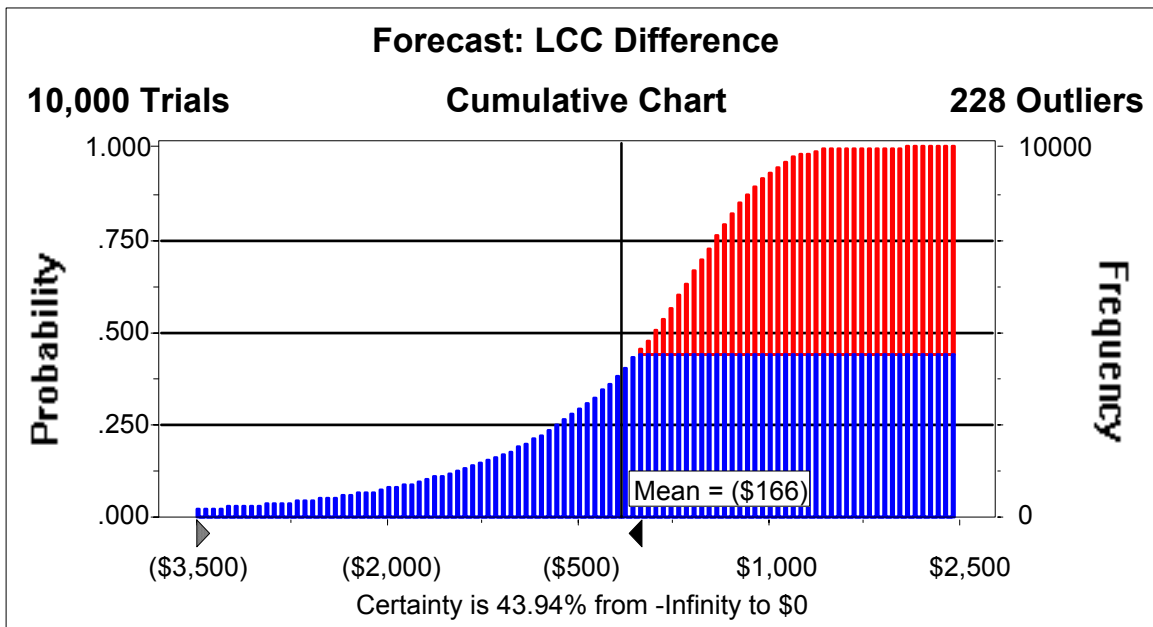


Figure E.32S Single Package HP, 18 SEER: Cumulative Chart of LCC Difference based on Reverse Engineering Manufacturing Costs

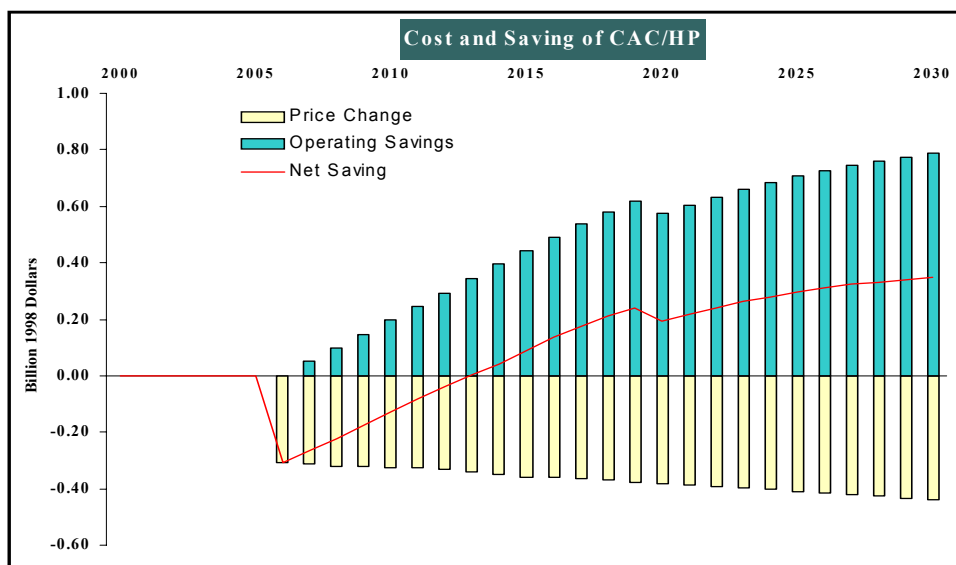
J.8 SUPPLEMENTAL TABLES AND FIGURES TO APPENDIX F

**Table F.1.1S Split A/C, 11 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.07	0.07	0.00	0.00	0.00
to 2020	0.45	0.45	0.00	0.00	0.00
to 2030	1.05	1.05	0.00	0.00	0.00

**Table F.1.2S Split A/C, 11 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	11 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split A/C Purchased from 2006 to 2030	
Discounted at 7% to year 1998	
Total Operating Savings	3.23
Total Equipment Cost	2.56
Net Present Benefit	0.68
Benefit/Cost Ratio	1.26



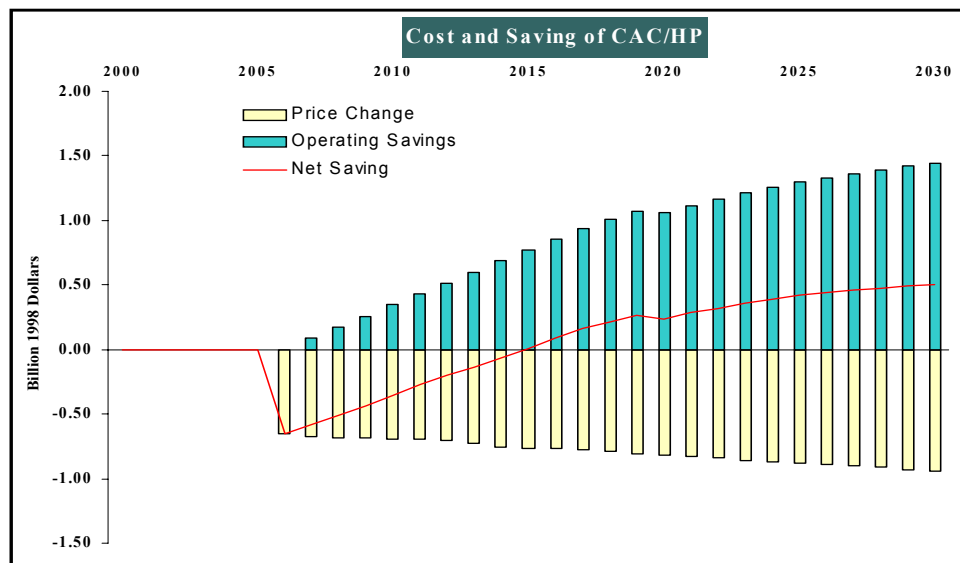
**Figure F.1S Split A/C, 11 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.2.1S Split A/C, 12 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.12	0.12	0.00	0.00	0.00
to 2020	0.79	0.79	0.00	0.00	0.00
to 2030	1.84	1.84	0.00	0.00	0.00

**Table F.2.2S Split A/C, 12 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	12 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split A/C Purchased from 2006 to 2030	
Discounted at 7% to year 1998	
Total Operating Savings	5.84
Total Equipment Cost	5.48
Net Present Benefit	0.36
Benefit/Cost Ratio	1.07



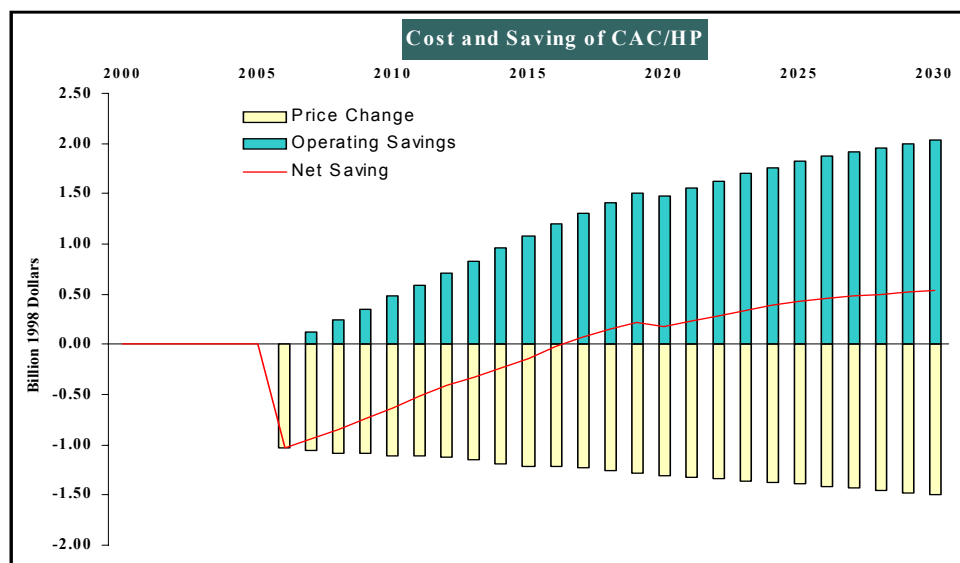
**Figure F.2S Split A/C, 12 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.3.1S Split A/C, 13 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.16	0.16	0.00	0.00	0.00
to 2020	1.11	1.11	0.00	0.00	0.00
to 2030	2.60	2.60	0.00	0.00	0.00

**Table F.3.2S Split A/C, 13 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	13 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split A/C Purchased from 2006 to 2030	
Discounted at 7% to year 1998	
Total Operating Savings	8.19
Total Equipment Cost	8.68
Net Present Benefit	-0.50
Benefit/Cost Ratio	0.94



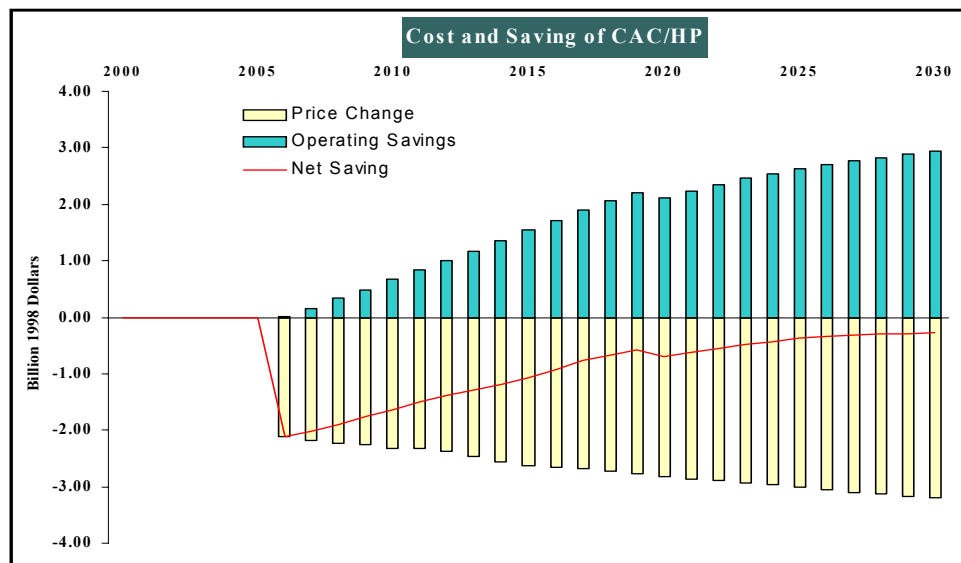
**Figure F.3S Split A/C, 13 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.4.1S Split A/C, 18 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.30	0.30	0.00	0.00	0.00
to 2020	2.09	2.09	0.00	0.00	0.00
to 2030	5.00	5.00	0.00	0.00	0.00

**Table F.4.2S Split A/C, 18 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	18 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split A/C Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	11.77
Total Equipment Cost	18.43
Net Present Benefit	-6.67
Benefit/Cost Ratio	0.64



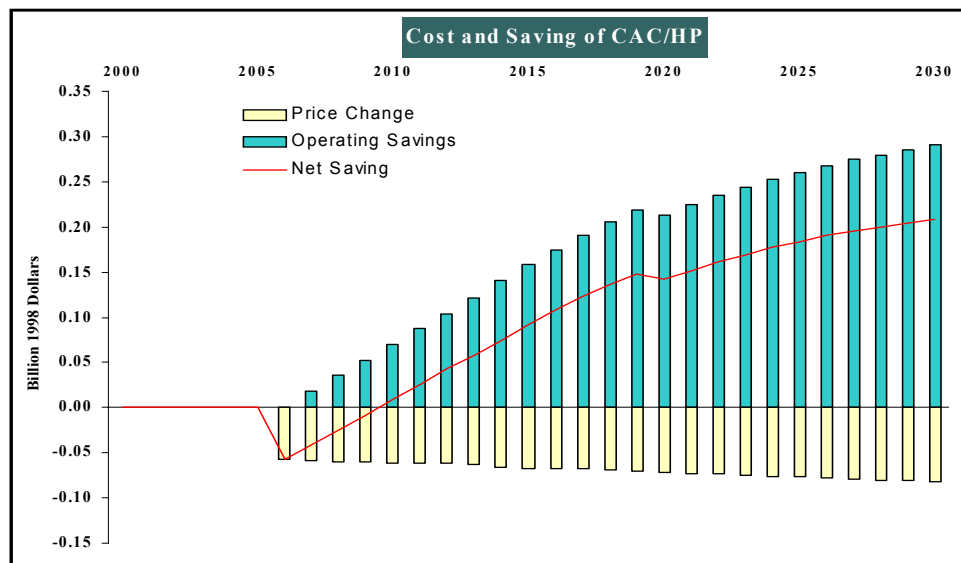
**Figure F.4S Split A/C, 18 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.5.1S Split HP, 11 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.03	0.03	0.00	0.00	0.00
to 2020	0.19	0.19	0.00	0.00	0.00
to 2030	0.45	0.45	0.00	0.00	0.00

**Table F.5.2S Split HP, 11 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	11 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	1.18
Total Equipment Cost	0.48
Net Present Benefit	0.70
Benefit/Cost Ratio	2.47



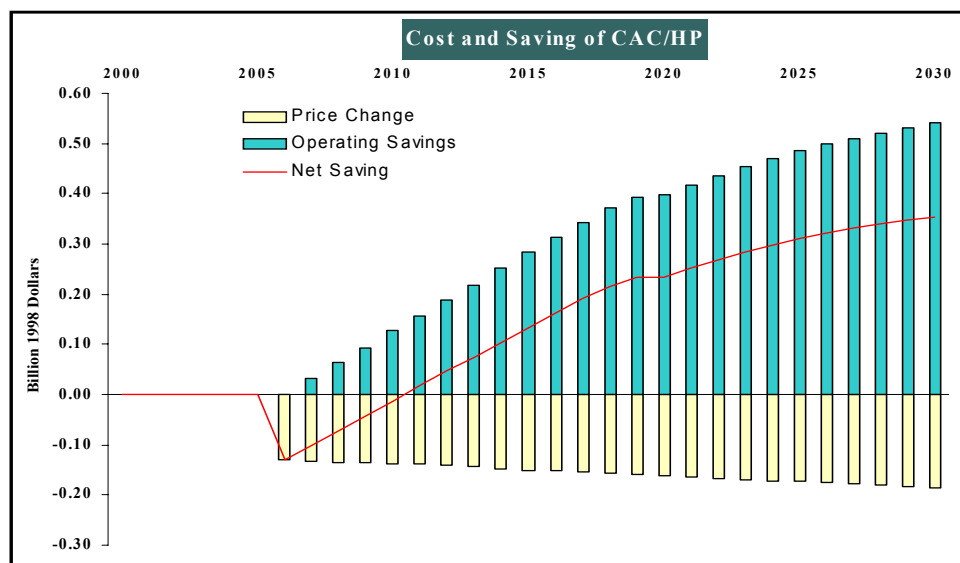
**Figure F.5S Split HP, 11 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.6.1S Split HP, 12 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.05	0.05	0.00	0.00	0.00
to 2020	0.35	0.35	0.00	0.00	0.00
to 2030	0.82	0.82	0.00	0.00	0.00

**Table F.6.2S Split HP, 12 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	12 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	2.18
Total Equipment Cost	1.08
Net Present Benefit	1.09
Benefit/Cost Ratio	2.01



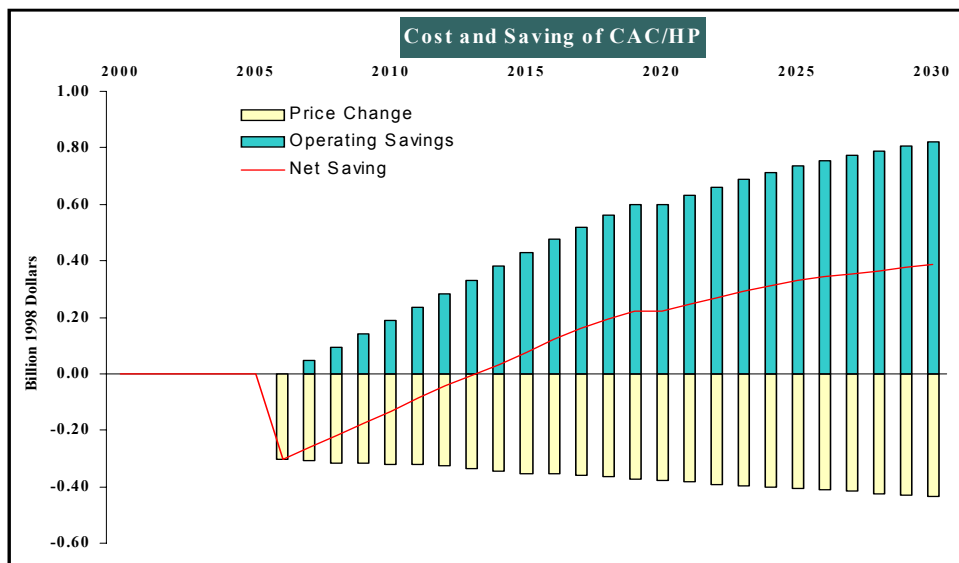
**Figure F.6S Split HP, 12 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.7.1S Split HP, 13 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.08	0.08	0.00	0.00	0.00
to 2020	0.53	0.53	0.00	0.00	0.00
to 2030	1.24	1.24	0.00	0.00	0.00

**Table F.7.2S Split HP, 13 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	13 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	3.29
Total Equipment Cost	2.53
Net Present Benefit	0.76
Benefit/Cost Ratio	1.30



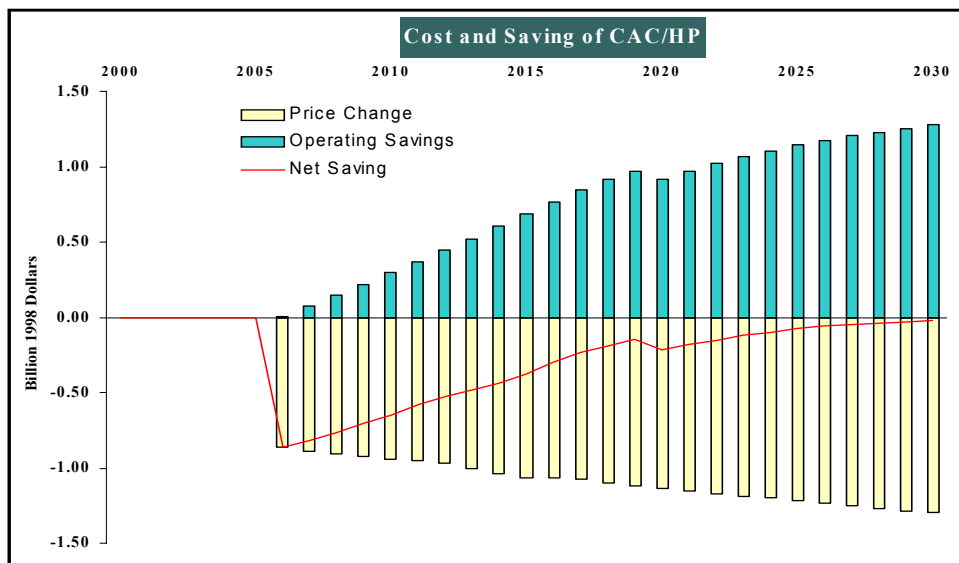
**Figure F.7S Split HP, 13 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.8.1S Split HP, 18 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.16	0.16	0.00	0.00	0.00
to 2020	1.09	1.09	0.00	0.00	0.00
to 2030	2.60	2.60	0.00	0.00	0.00

**Table F.8.2S Split A/C, 18 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	18 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Split HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	5.15
Total Equipment Cost	7.49
Net Present Benefit	-2.34
Benefit/Cost Ratio	0.69



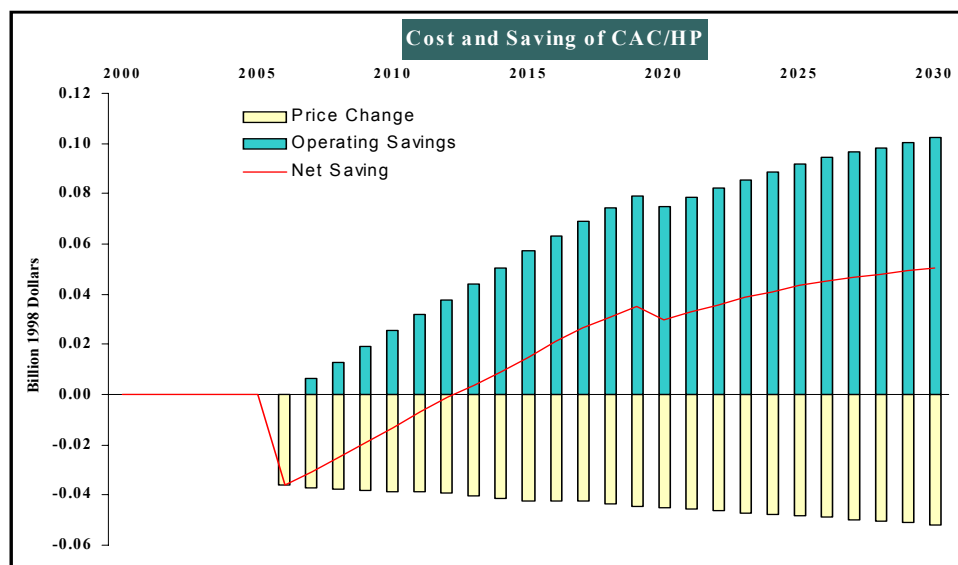
**Figure F.8S Split HP, 18 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.9.1S Pack. A/C, 11 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.01	0.01	0.00	0.00	0.00
to 2020	0.06	0.06	0.00	0.00	0.00
to 2030	0.13	0.13	0.00	0.00	0.00

**Table F.9.2S Pack. A/C, 11 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	11 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package A/C Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	0.42
Total Equipment Cost	0.30
Net Present Benefit	0.12
Benefit/Cost Ratio	1.39



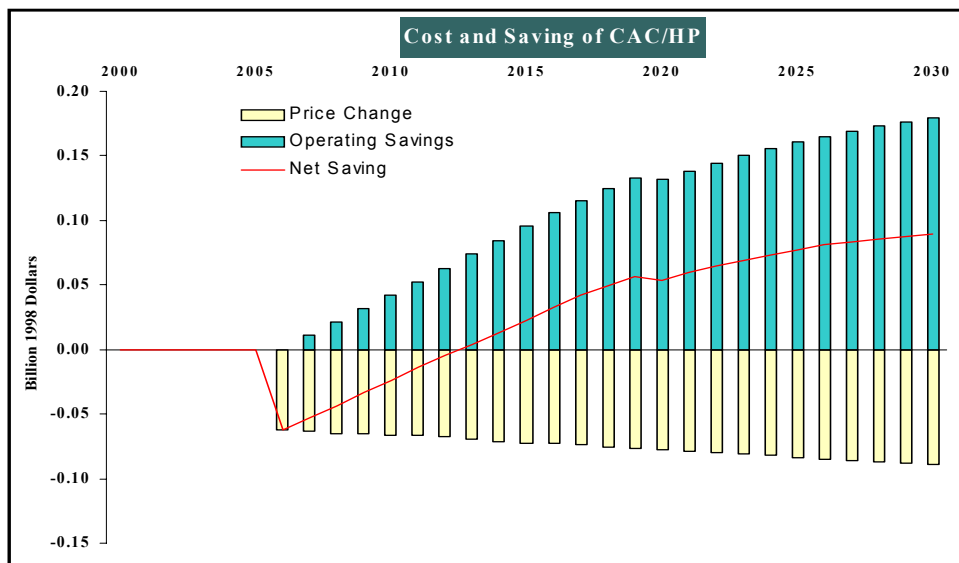
**Figure F.9S Package A/C, 11 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.10.1S Pack. A/C, 12 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.01	0.01	0.00	0.00	0.00
to 2020	0.10	0.10	0.00	0.00	0.00
to 2030	0.23	0.23	0.00	0.00	0.00

**Table F.10.2S Pack. A/C, 12 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	12 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package A/C Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	0.72
Total Equipment Cost	0.52
Net Present Benefit	0.20
Benefit/Cost Ratio	1.39



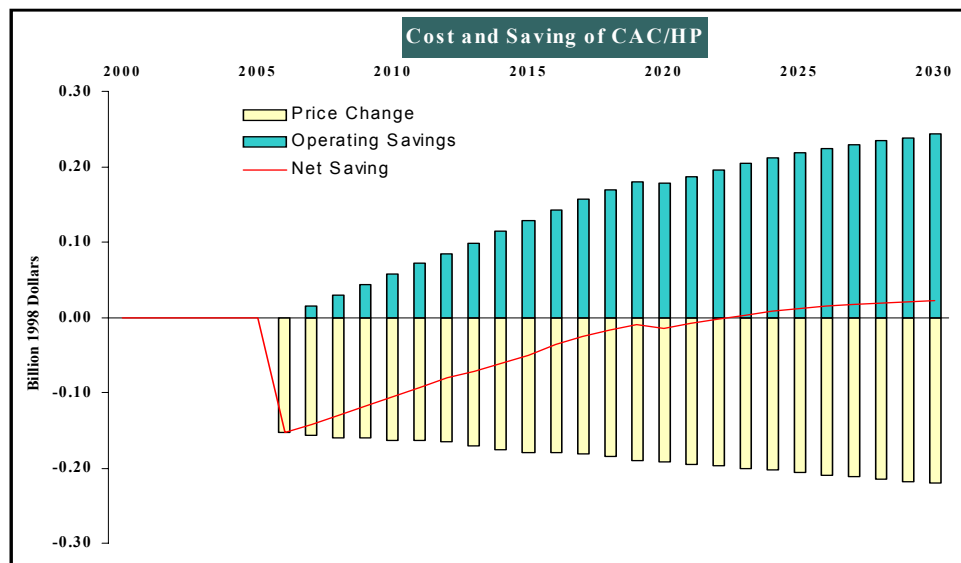
**Figure F.10S Package A/C, 12 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.11.1S Pack. A/C, 13 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.02	0.02	0.00	0.00	0.00
to 2020	0.13	0.13	0.00	0.00	0.00
to 2030	0.31	0.31	0.00	0.00	0.00

**Table F.11.2S Pack. A/C, 13 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	13 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package A/C Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	0.98
Total Equipment Cost	1.28
Net Present Benefit	-0.30
Benefit/Cost Ratio	0.77



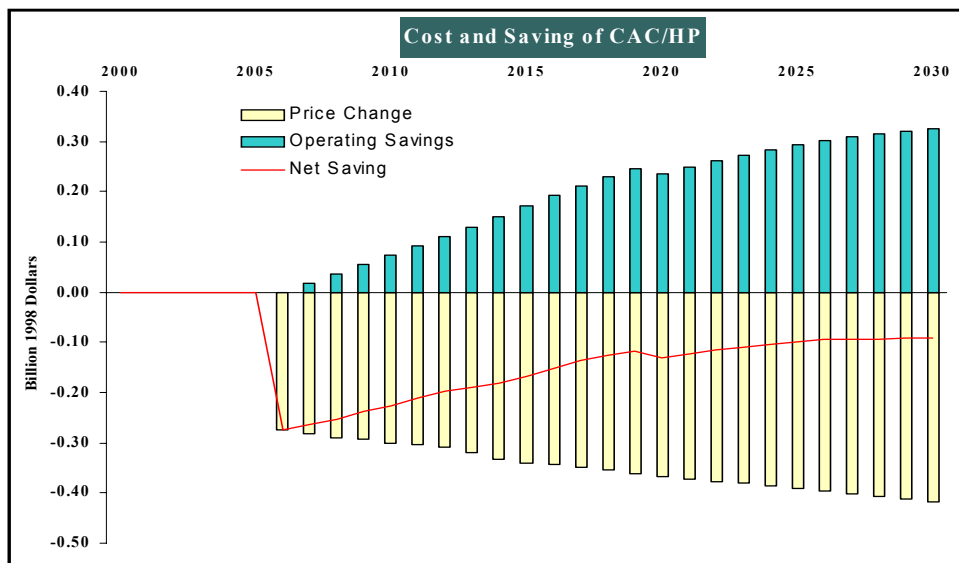
**Figure F.11S Package A/C, 13 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.12.1S Pack. A/C, 18 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.03	0.03	0.00	0.00	0.00
to 2020	0.24	0.24	0.00	0.00	0.00
to 2030	0.58	0.58	0.00	0.00	0.00

**Table F.12.2S Pack. A/C, 18 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	18 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package A/C Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	1.31
Total Equipment Cost	2.39
Net Present Benefit	-1.09
Benefit/Cost Ratio	0.55



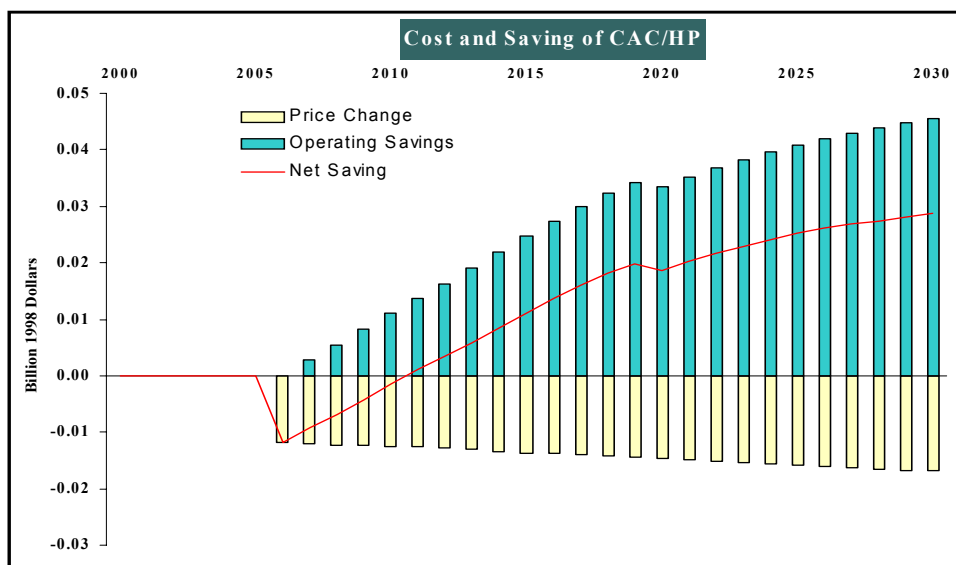
**Figure F.12S Package A/C, 18 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.13.1S Pack. HP, 11 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.00	0.00	0.00	0.00	0.00
to 2020	0.03	0.03	0.00	0.00	0.00
to 2030	0.07	0.07	0.00	0.00	0.00

**Table F.13.2S Pack. HP, 11 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	11 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	0.19
Total Equipment Cost	0.10
Net Present Benefit	0.09
Benefit/Cost Ratio	1.88



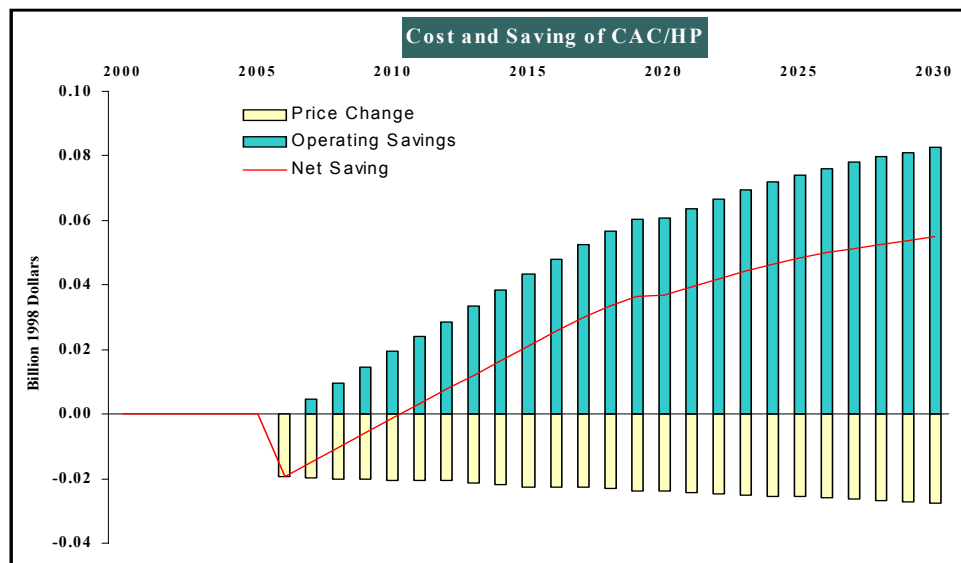
**Figure F.13S Package HP, 11 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.14.1S Pack. HP, 12 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.01	0.01	0.00	0.00	0.00
to 2020	0.05	0.05	0.00	0.00	0.00
to 2030	0.12	0.12	0.00	0.00	0.00

**Table F.14.2S Pack. HP, 12 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	12 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	0.33
Total Equipment Cost	0.16
Net Present Benefit	0.17
Benefit/Cost Ratio	2.07



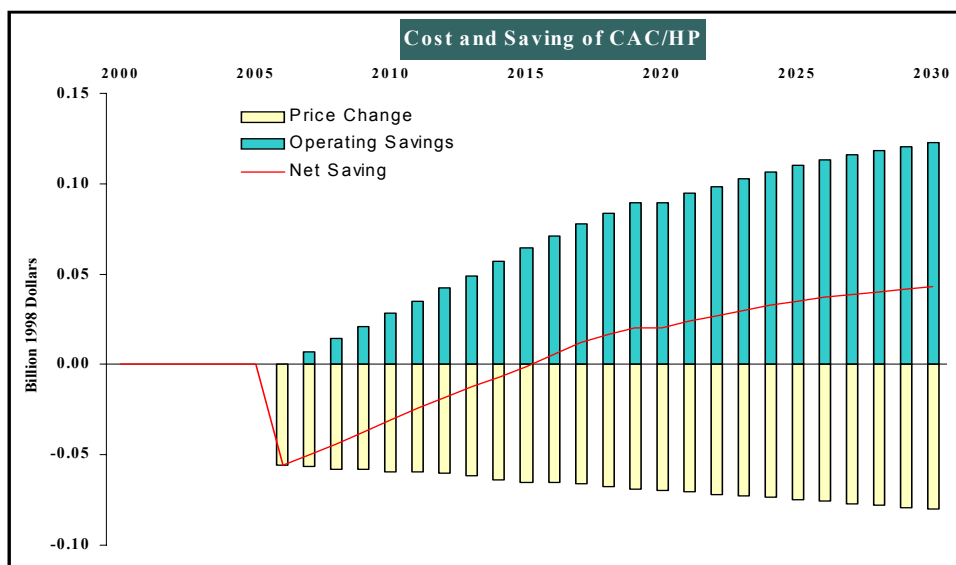
**Figure F.14S Package HP, 12 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.15.1S Pack. HP, 13 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.01	0.01	0.00	0.00	0.00
to 2020	0.08	0.08	0.00	0.00	0.00
to 2030	0.19	0.19	0.00	0.00	0.00

**Table F.15.2S Pack. HP, 13 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	13 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	0.49
Total Equipment Cost	0.46
Net Present Benefit	0.03
Benefit/Cost Ratio	1.06



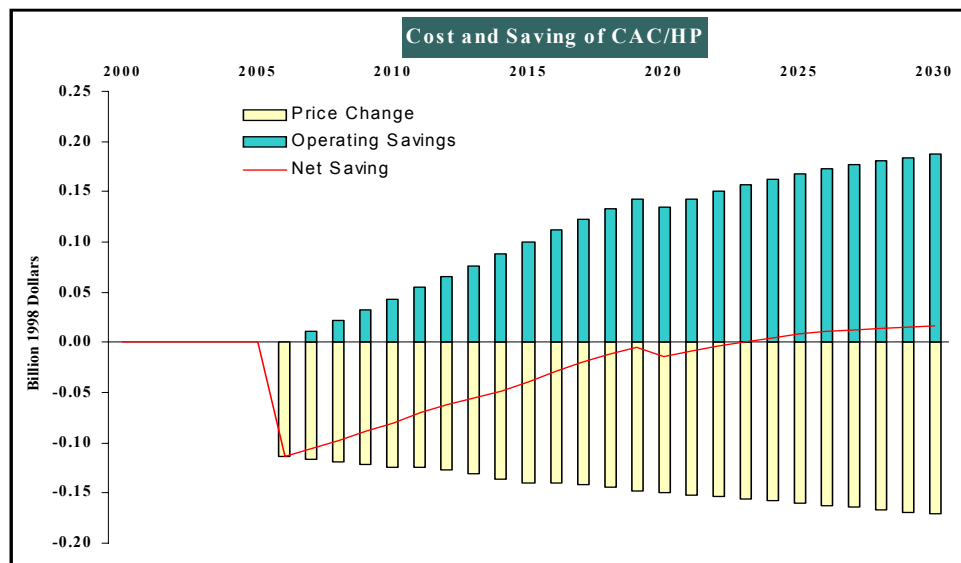
**Figure F.15S Package HP, 13 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

**Table F.16.1S Pack. HP, 18 SEER: Energy Savings
based on Rev Eng Manufacturing Costs**

	Energy Saving in Quads				
	Total	Elec	Gas	Oil	LPG
from 2006					
to 2010	0.02	0.02	0.00	0.00	0.00
to 2020	0.15	0.15	0.00	0.00	0.00
to 2030	0.37	0.37	0.00	0.00	0.00

**Table F.16.2S Pack. HP, 18 SEER: Costs and Net Present Value
based on Rev Eng Manufacturing Costs**

CAC/HP Standards in 2006:	18 SEER
Cost and Net Present Values (in billion 1998\$)	
Cumulative for Package HP Purchased from 2006 to 2030 Discounted at 7% to year 1998	
Total Operating Savings	0.76
Total Equipment Cost	0.98
Net Present Benefit	-0.23
Benefit/Cost Ratio	0.77



**Figure F.16S Package HP, 18 SEER: Annual Savings and Costs based on
Reverse Engineering Manufacturing Costs**

